Map the World in 3D

GreenValley APP

User Guide

GreenValley International Inc.

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Chapter I Software Features

The GreenValley APP is a point cloud collection software independently developed by GreenValley International, designed specifically for airborne and SLAM LiDAR scanning systems. It is easy to operate and fully functional. The APP is compatible with all series of LiAir devices, among which LiAir X3 and newer devices support automatic powerline following functionality; Compatible with LiGrip series devices and LiBackpack DGC50H, suitable for Android and Apple phones, and equipped with voice prompts to make it more convenient for you to operate the device.

Note: The Apple version does not support the operation and route planning of LiAir devices, only the activation of LiAir devices.

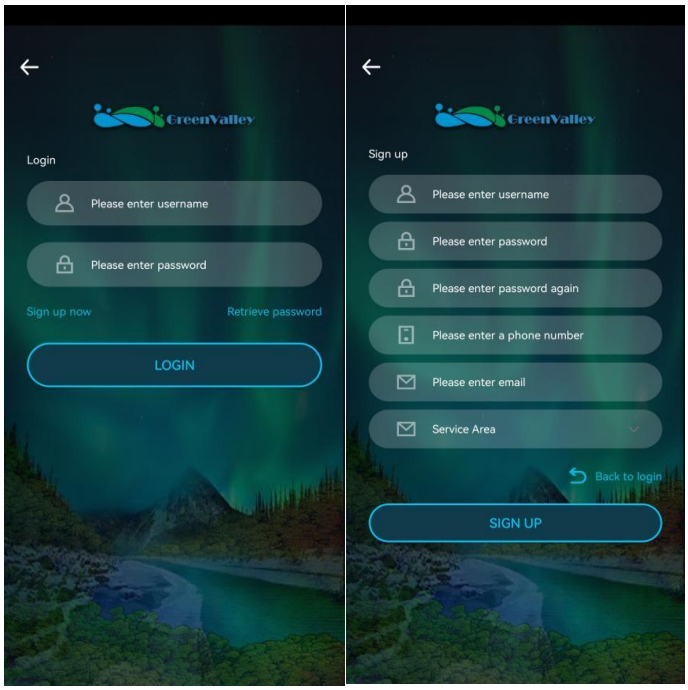
1.1. Login and Registration

After opening the software interface, click on the "**Home**" interface, and select "Login".



If you already have a LiCloud account, simply enter your account and password to log in.

If you do not have a LiCloud account, you need to click "**Sign Up**", enter your username, password, phone number, and email to complete the registration. After registration, you can return to the login interface to continue logging in.

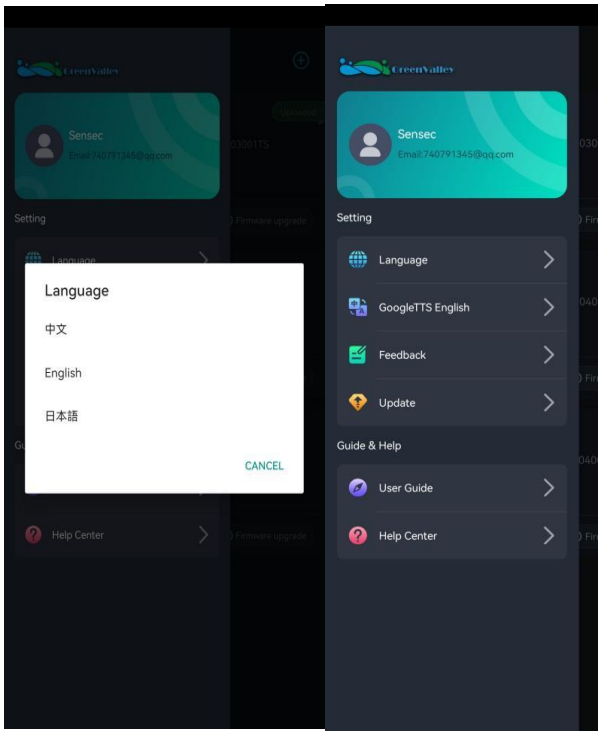


Note: The LiCloud account is related to device activation, online firmware upgrade, APP upgrade, feedback, etc. Other device operations, such as offline upgrade, RTK configuration, log sharing, etc., are not related.

1.2. Voice Prompts

In the APP settings, select the language used for voice prompts. Currently, Chinese, English, and Japanese are supported. The APP will check whether the mobile device has the Google TTS voice engine. If the language engine is not available, the APP settings will display "**Google TTS speech engine is not installed, language resources are missing or not supported**". At this point, clicking here will guide the mobile device to install the engine.

After successful installation, return to the APP and click again on "**Google TTS speech engine is not installed, language resources are missing or not supported**". At this point, the APP will guide the mobile device to set text-to-speech prompts to the Google TTS voice engine.



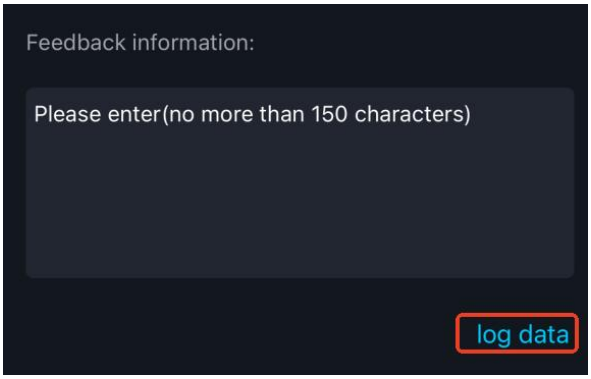
After completing the setup, return to the APP, and you will see that the APP settings display "**Google TTS (selected language)**", indicating that the voice engine installation was successful, and there will be voice prompts during operation.

1.3. Feedback

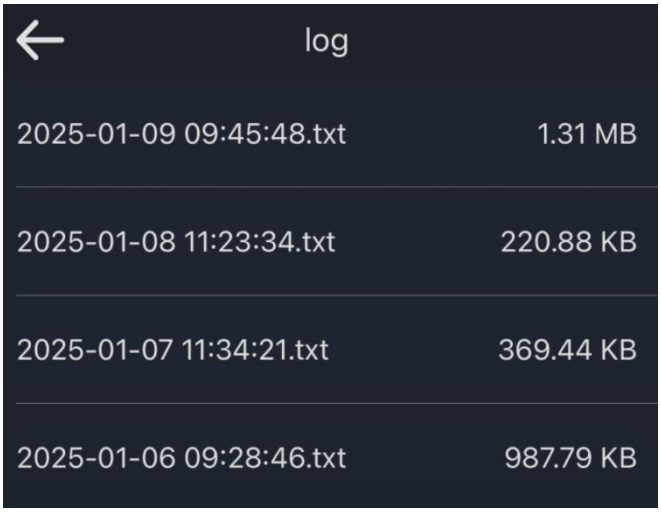
Feedback allows you to provide valuable suggestions or share APP ’s logs records during the use of the APP.

1.3.1.Share Log files

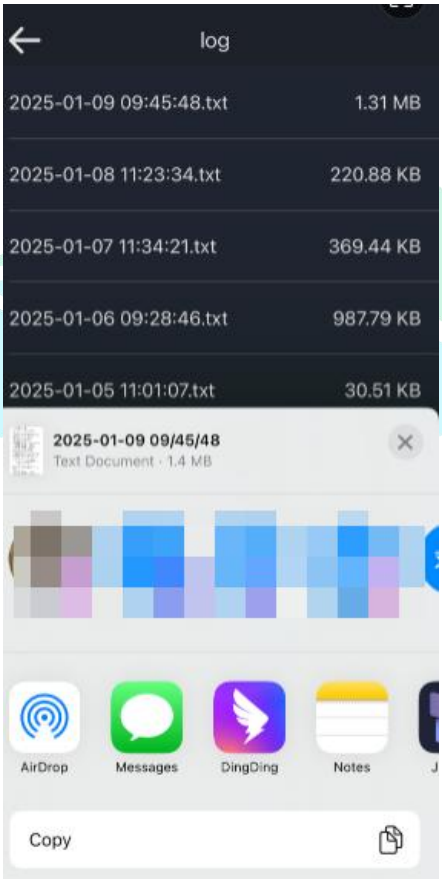
You can share log files with technical support teams and after-sales for problem analysis.



The APP logs are recorded daily.

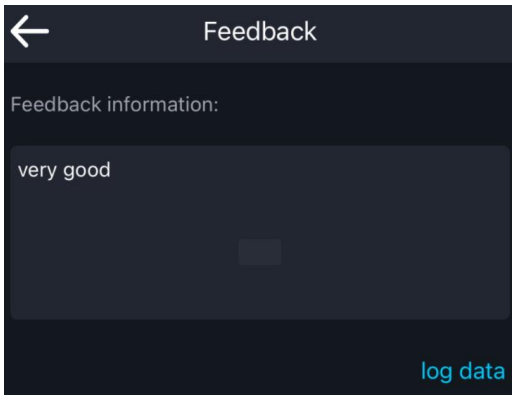


After clicking a log, click "**Share**" (iOS will directly pop up a sharing channel) to share it via the APP or other methods.



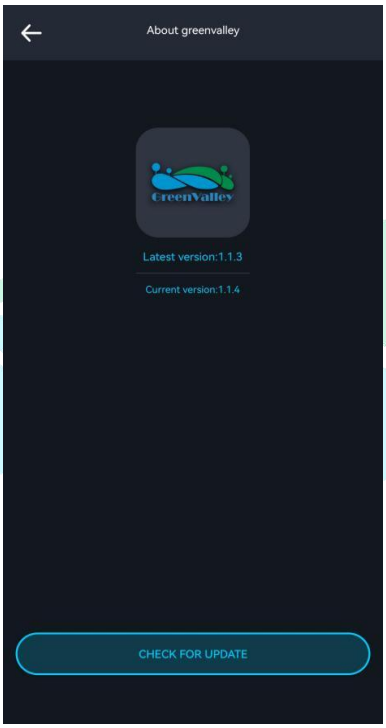
1.3.2.Feedback

If you have any suggestions for the product, you can provide them here.



1.4. Update

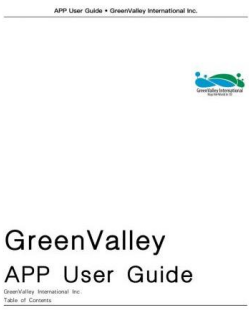
Click "**Update**" to check for a new version of the APP and upgrade the APP.



1.5. User Guide

Click "**User Guide**" to view the GreenValley APP User Guide.

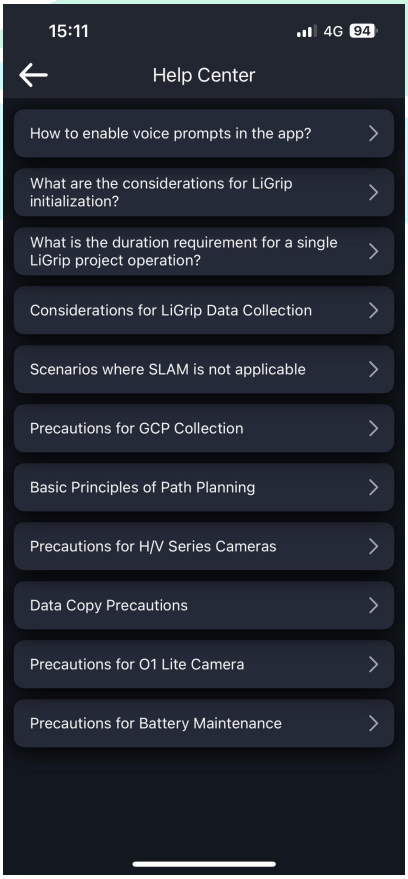






1.6. Help Center

Enter "**Help Center**" to get some frequently asked questions and answers.



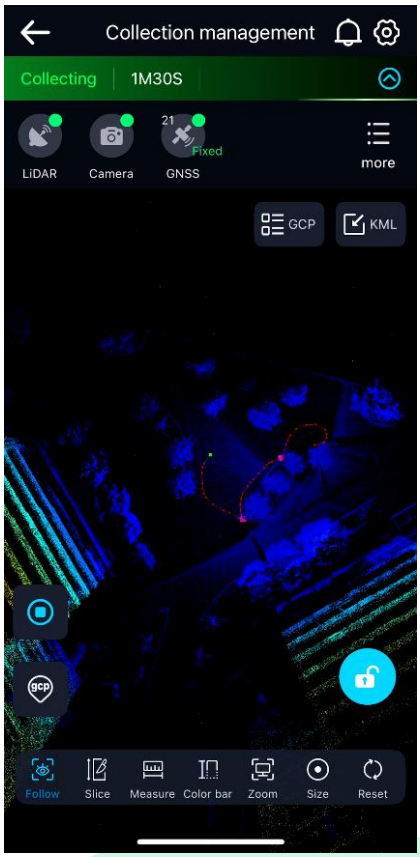
1.7. Device Management

The Device Management interface allows for project management, activation, firmware upgrades, device diagnostics, and start collection operations.



1.8. Collection Management

The Collection Management page is the main interface for device collection, displaying device status and current coordinates, and allows for GCP collection, KML file import, and breakpoint continuation scan.



Chapter II Connect Device

After the device is powered on and the indicator light stops flashing, open the APP.

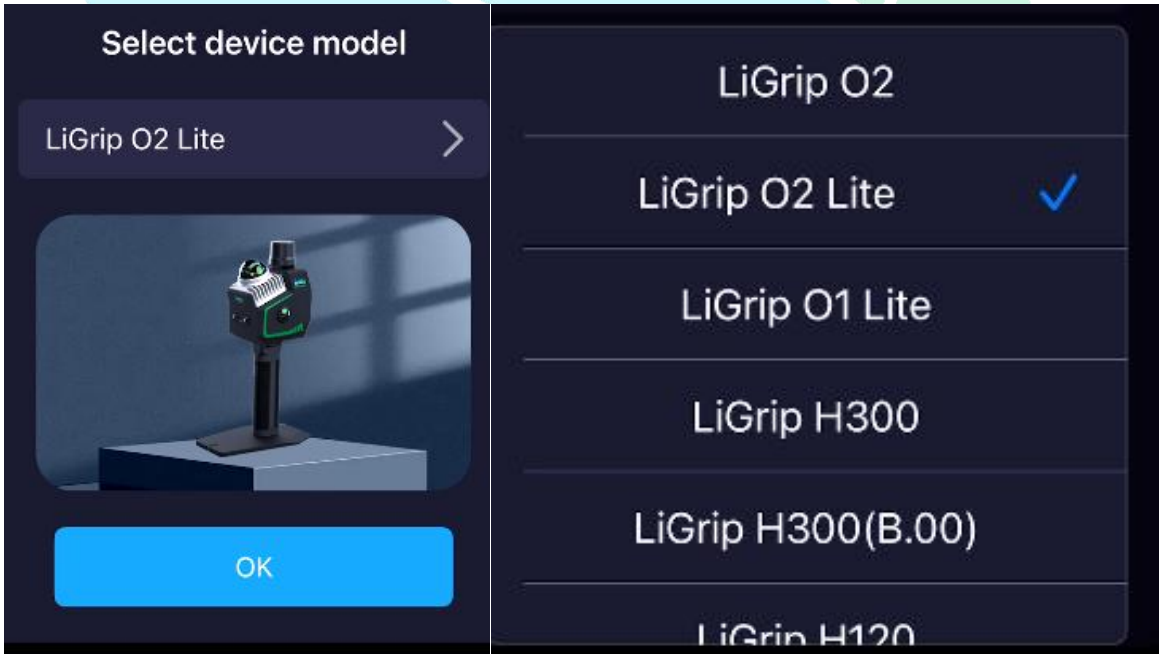
In the home page section, select the type of device you need to connect: LiGrip/LiBackpack/LiAir. We will use connecting LiGrip as an example for explanation; connecting LiBackpack is basically the same as LiGrip.



2.1. Select Device Model

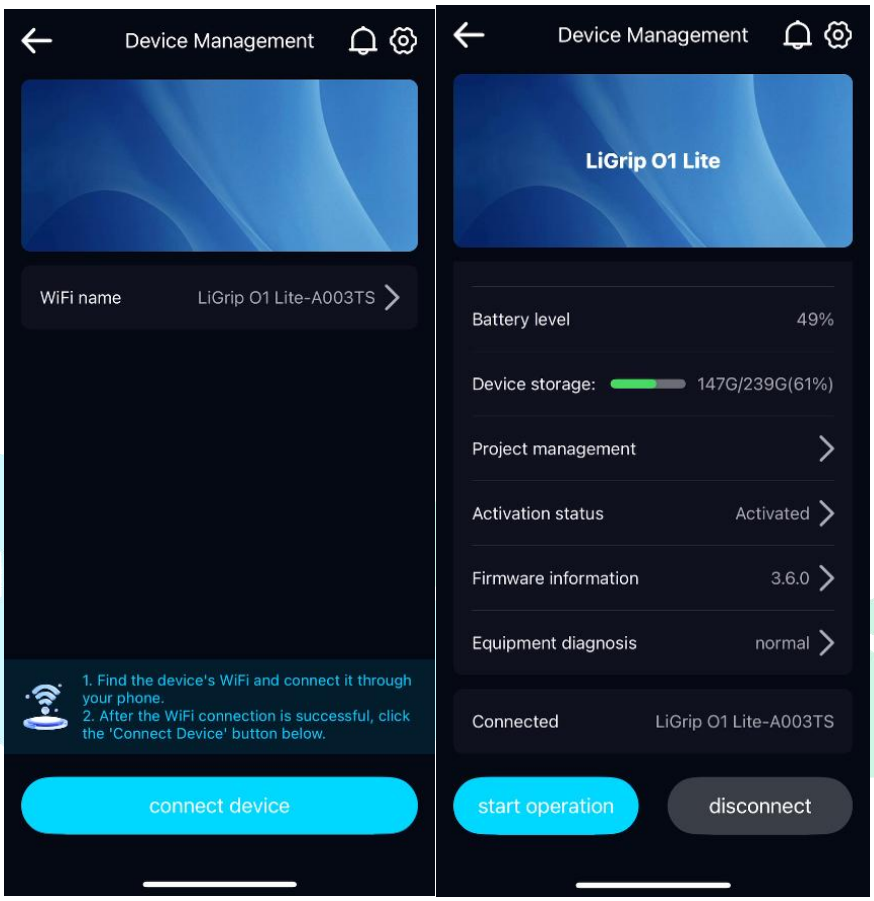
After clicking on LiGrip, the APP will prompt you to select a specific device model. You can choose according to the model of your device.

Note: Different models have different communication methods, please select correctly.



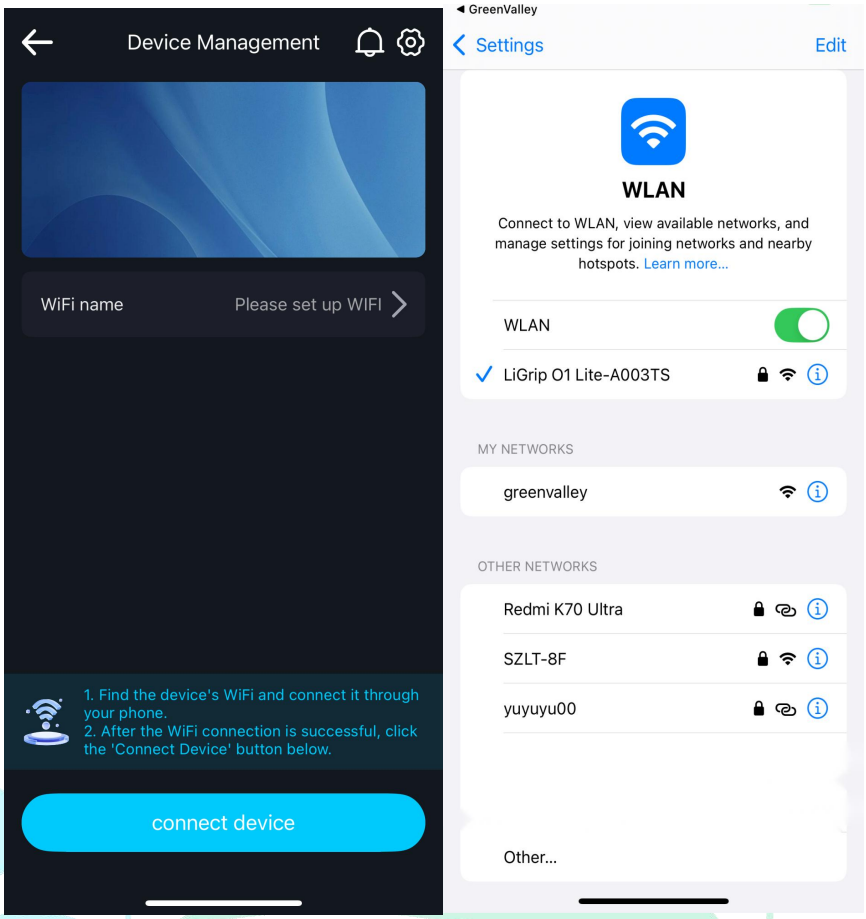
2.2. Connection of O1 Lite/H Series, V100 Device

If the phone has previously (automatically) connected to the device's WiFi (name starting with LiGrip), the connected device WiFi name will be displayed here automatically. Then click on "**connect device**", and the APP will automatically navigate to the main device management interface.



Note: The password for the LiGrip device WiFi is uniformly ***"greenvalley"***

If the phone has not previously connected to the device WiFi, click on " **Please set up WIFI** ", and the system will automatically navigate to the WLAN settings. We select the device's WiFi (name starting with LiGrip), then return, and the APP will display the name of the connected WiFi. Finally, click on "**connect device**", and the APP will automatically navigate to the main device management interface.



2.3. Connection of the O2 Series

The O2 series supports two different connection methods, AP Hot spot and WIFI connection.

When you need to use the RTK function, use the AP Hot spot method, and when you don’t need RTK, use the WIFI connection method. When we select the O2/O2-Lite device, the APP will pop up a dialog box "Do you use RTK".



"**Yes**" means that the AP hot spot connection method will be used next, and "**No**" means that the WIFI connection method will be used next.

2.3.1.WIFI connection

Refer to the steps described in Section 2.2 to make the connection;

2.3.2.AP hot spot connection

Connection principle: The O2 series relies on the mobile phone to actively transmit the Hot spot, and the device communicates after connecting to the mobile phone Hot spot.

Note:

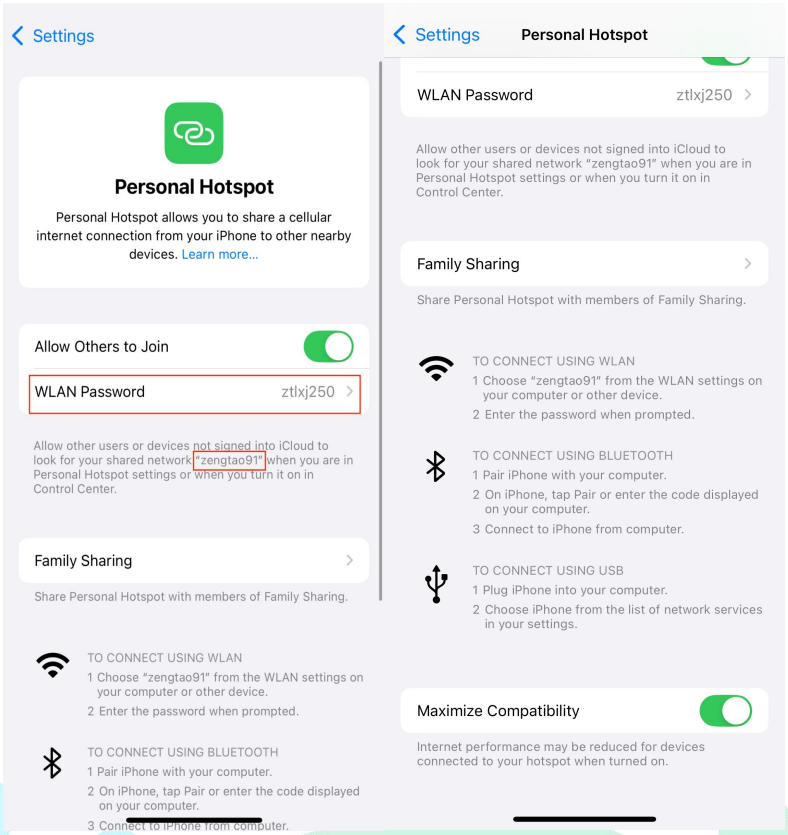
Before connecting the device, please turn on the mobile phone hots pot in advance.

If the device is already connected to the mobile phone hot spot, and you want to switch to another mobile phone or switch to a WIFI connection device, you must short press the power button 3 times to reconnect.

2.3.3.iOS

2.3.3.1.Turn on Hot spot

In the iOS system, open the Personal Hot spot settings and it is recommended to enable the "**Maximize Compatibility**" setting. **Remember the Hot spot's SSID and password.**



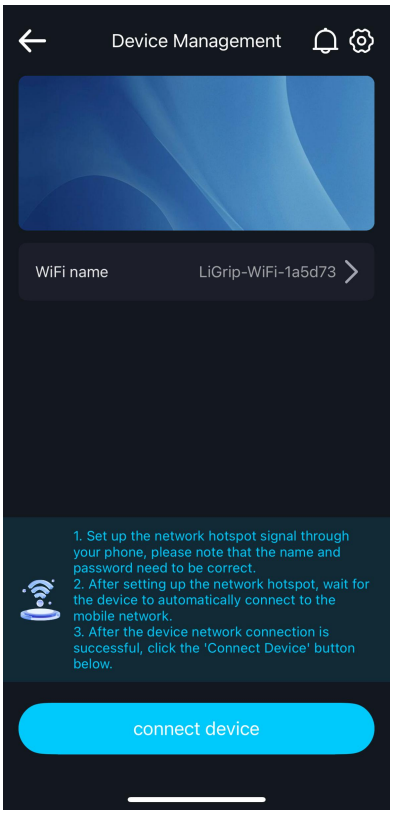
2.3.3.2.Connect Device

(1)First-time Device Connection

Here, 'first-time' refers to **when your phone connects to the device for the first time**.

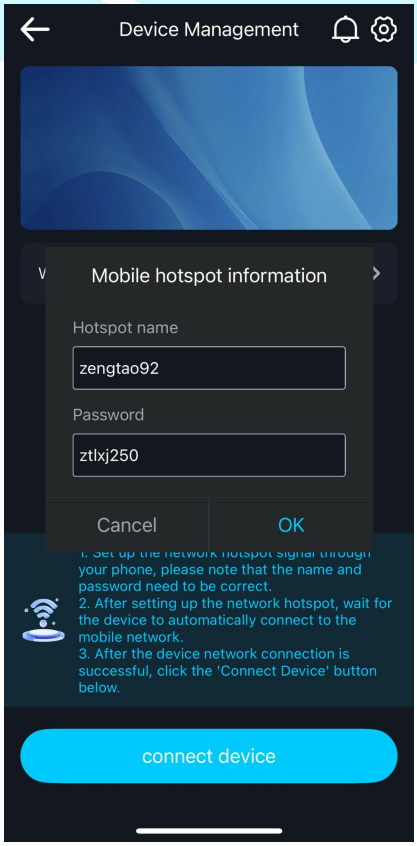
After setting up the Hot spot, open the mobile APP, select the LiGrip device type, and choose the O2 Series model.

Here, you need to connect to the device's WiFi (name starting with LiGrip), following the steps described in section 2.2.

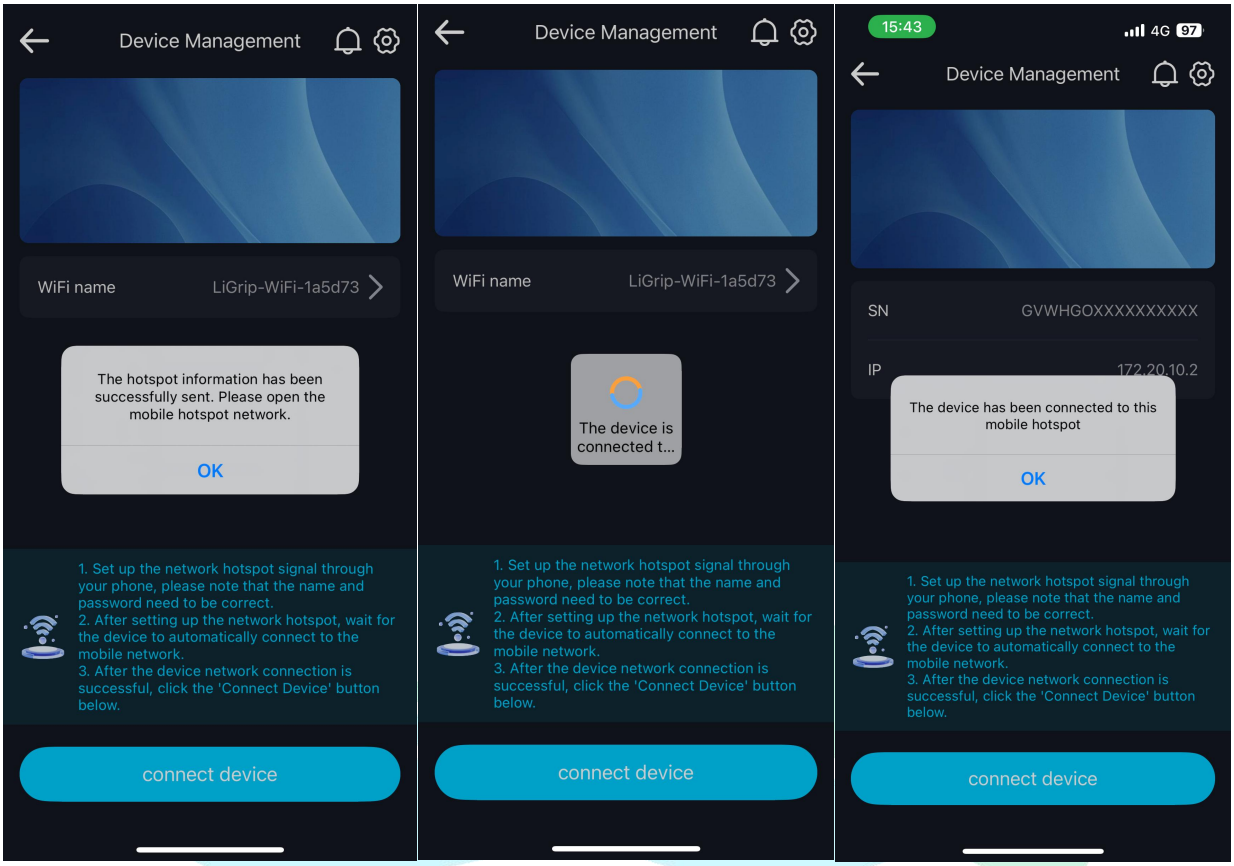


Note: The password for the LiGrip device WiFi is uniformly ***"greenvalley"***

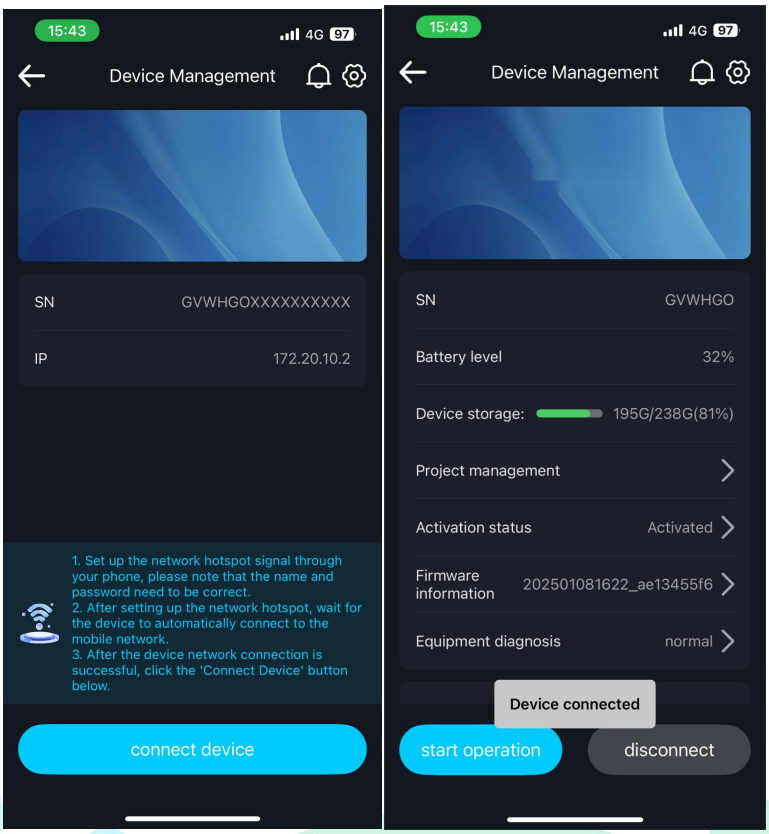
After connecting to the device's WiFi, the APP will prompt you to enter the Hot spot's name and password here.



After clicking '**OK**', the Hot spot's name and password will be automatically sent to the device, allowing it to save the Hot spot information for automatic connection next time. When the APP prompts '**The device has been connected to this mobile Hot spot**', the device has stored the Hot spot information and is connected to the mobile Hot spot.

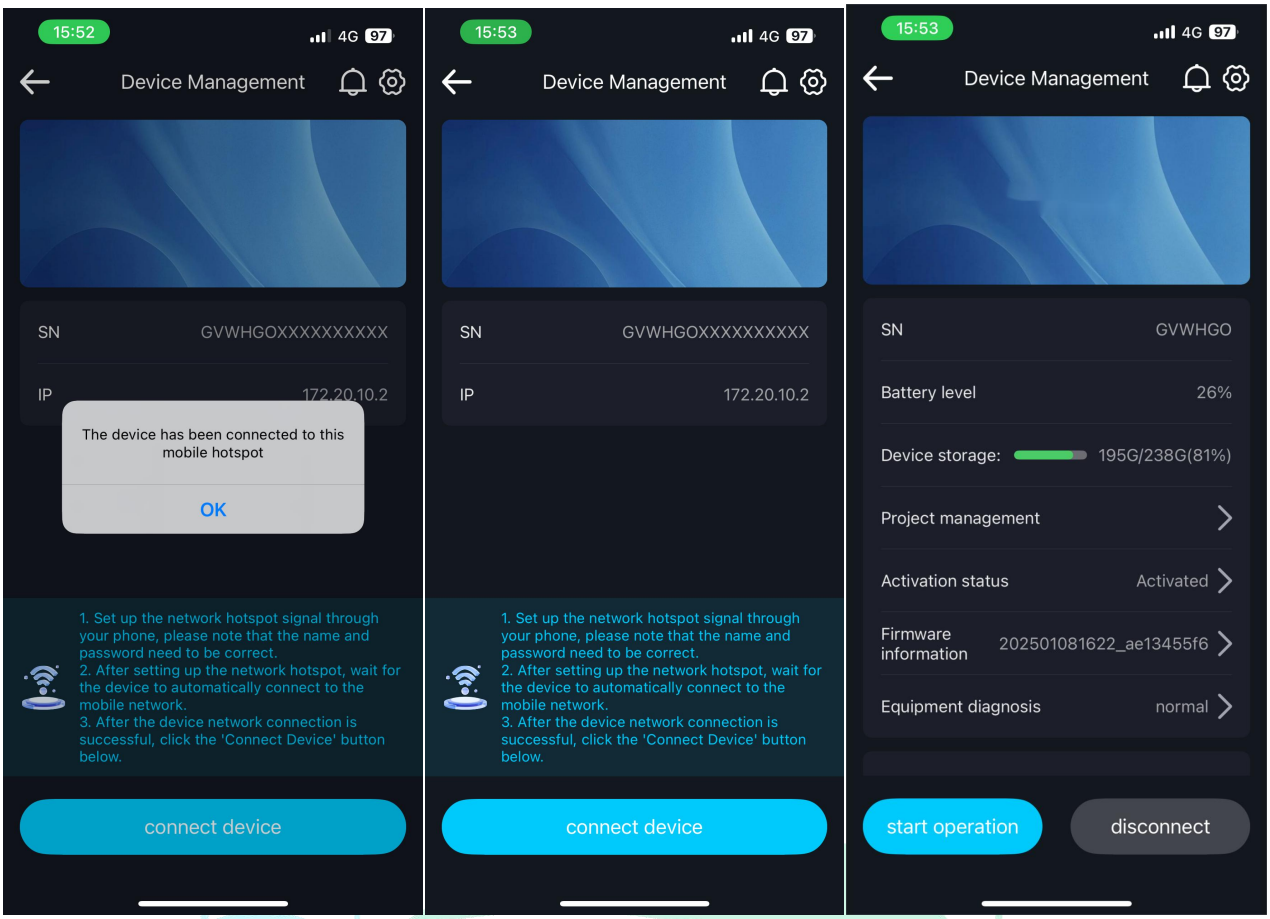


When the Hot spot is connected, we can click "**connect device**" to enter the device management interface and start collection operations.



(2)Not the first time connecting the device

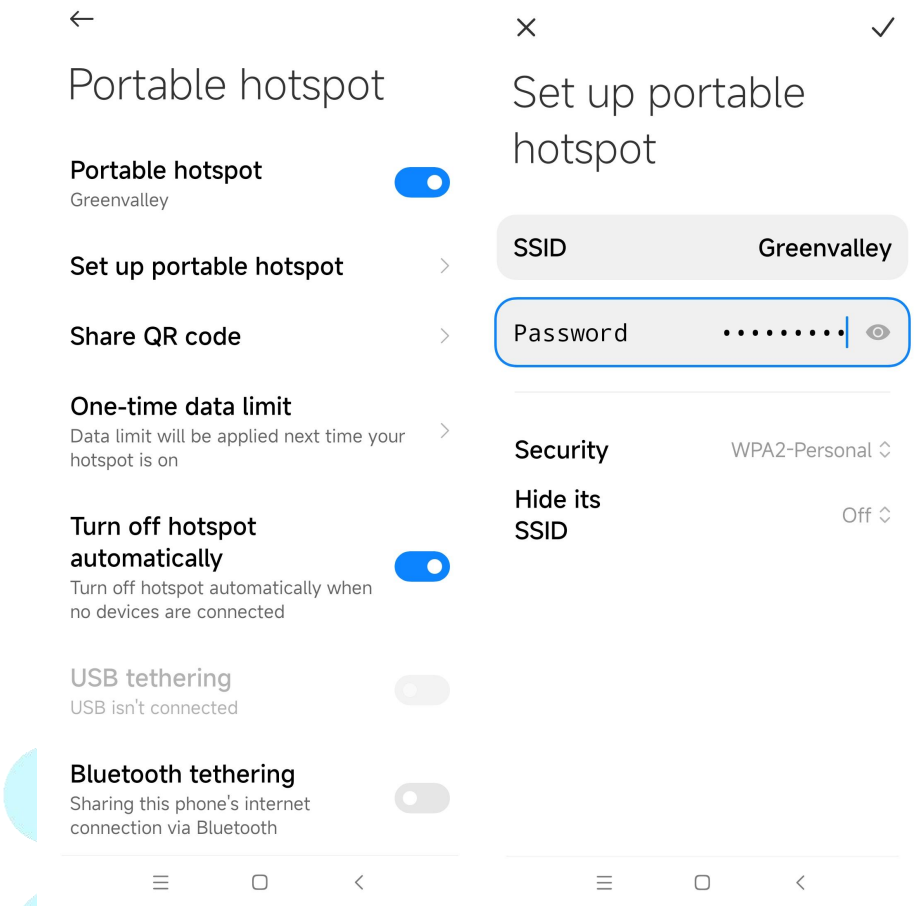
When the mobile Hot spot (name and password) has not changed, the device will automatically connect to the mobile Hot spot without requiring additional operations. After the mobile Hot spot is turned on, we directly open the APP, select the correct device model, and the APP will directly prompt "**The device has been connected to this mobile Hot spot**". Finally, we click "**connect device**" to enter the device management interface and perform collection operations.



2.3.4.Android

2.3.4.1.Turn on Hot spot

The Android mobile Hot spot is easy to set up and turn on, allowing you to set the name and password according to your needs.

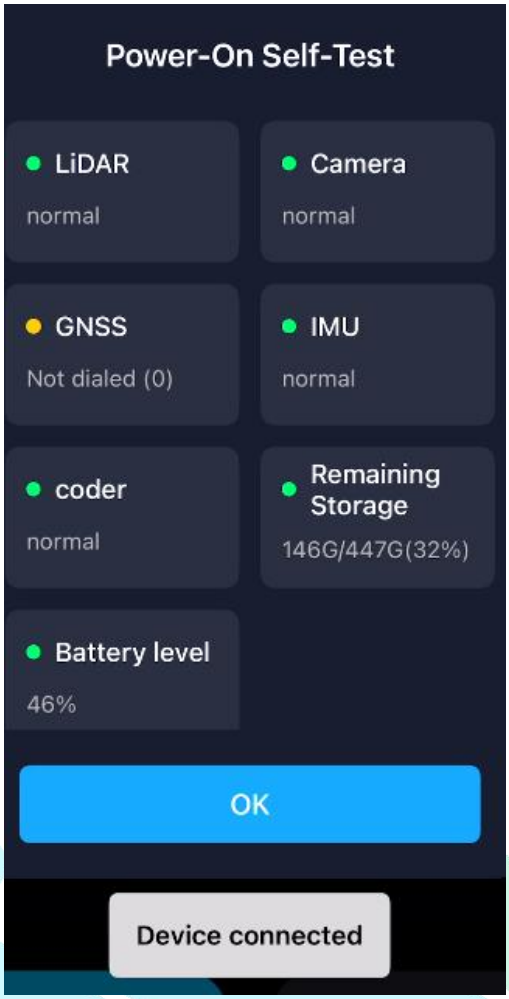


2.3.4.2.Connect Device

The connection process for Android is the same as the steps for connecting to the iOS system in section 2.3.3.2, which can be referenced.

2.4. Power-On Self-Test

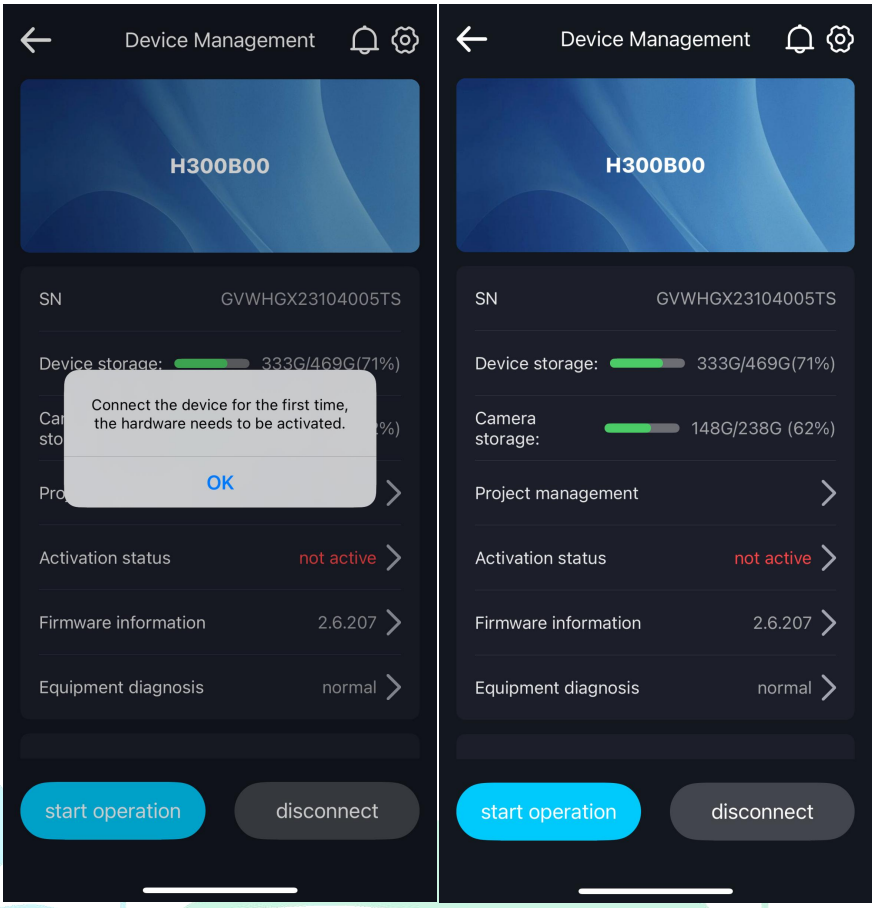
When the device is connected, it will perform a self-check and display the result on the APP in a pop-up window;



Chapter III Device Activation

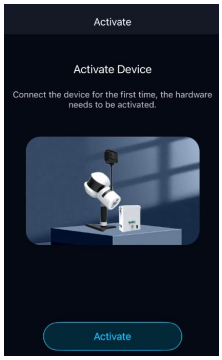
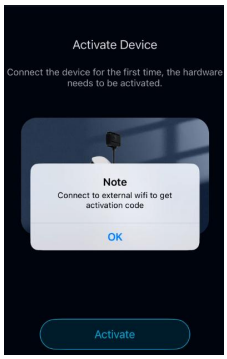
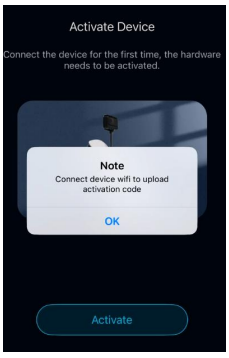
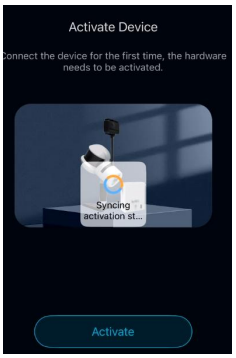
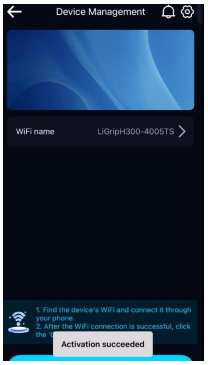
When first connecting to the device WiFi, the APP will prompt the user to activate the device (the device status bar will display 'not active').

Note: Activating the device requires logging into an account



3.1. Activation of O1 Lite/H Series, V100/DGC50H Devices

We click on the activation status bar, and the device automatically jumps to the activation window. Follow the prompts to perform device activation.

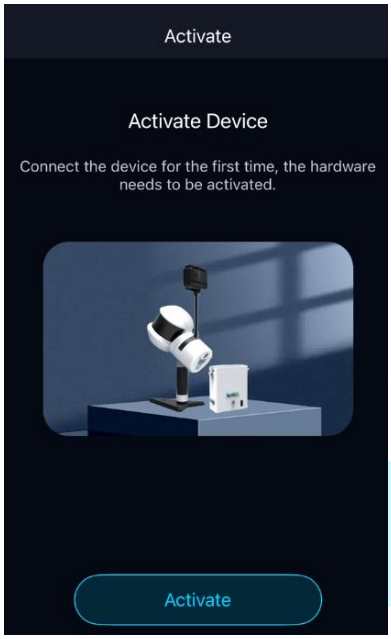
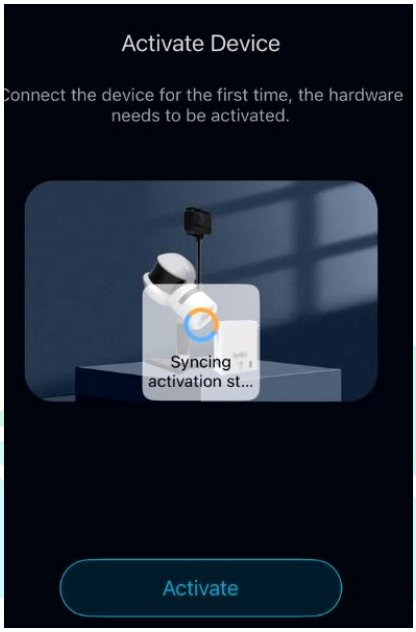
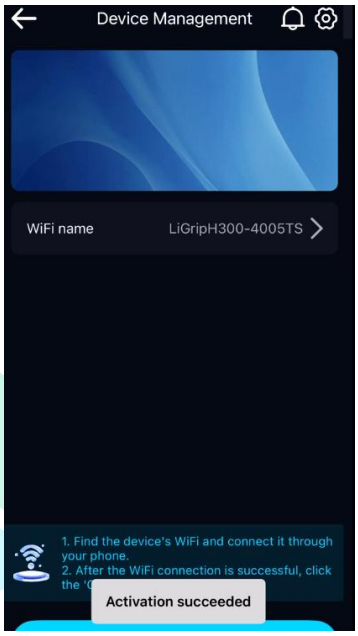
				
A.Click on "**Activate**"	B.Connect to the external network for activation	C.Connect to the device's WiFi to upload the activation code	D.Activating	E.Activation Successful

When the device is activated, the email associated with the APP account will receive a notification of successful activation.

3.2. Activation of the O2 Series

Since the O2 Series connects to a mobile Hot spot, there is no need to switch networks back and forth. Click on "**Activate**" and wait for the APP to prompt successful activation.

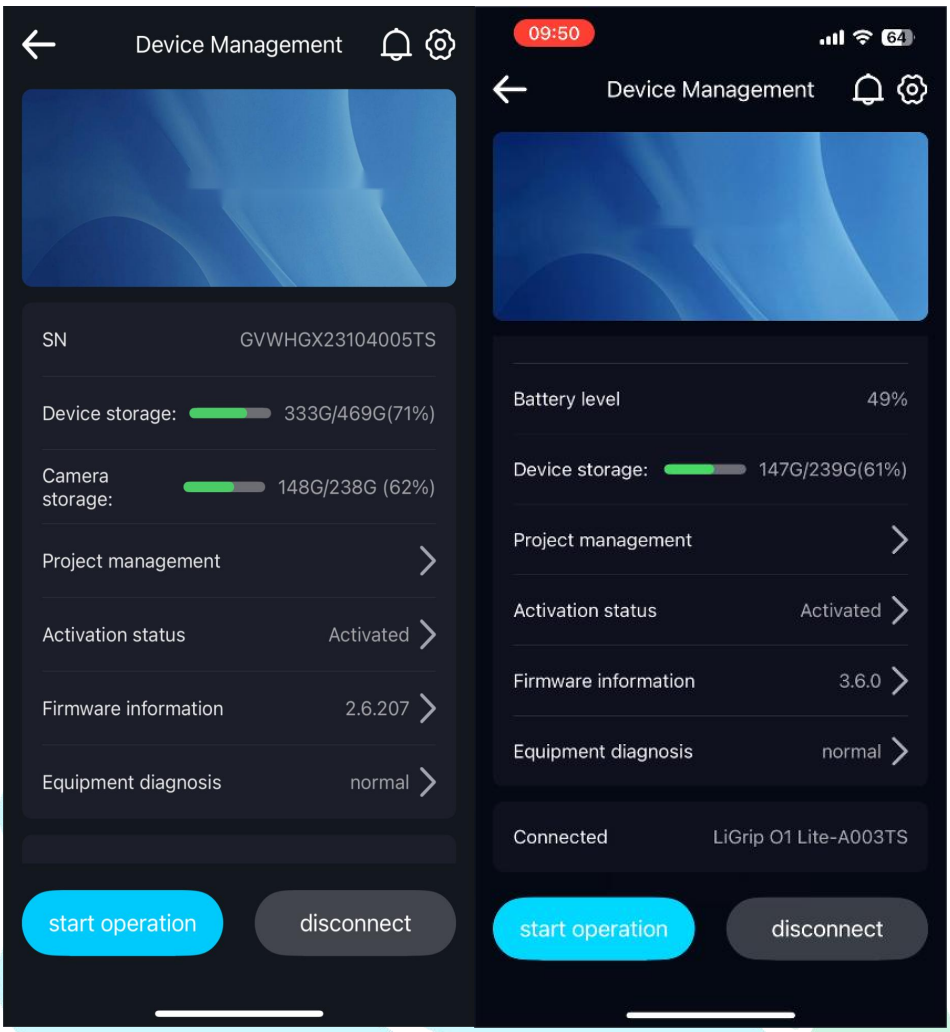
When the device is activated, the email associated with the APP account will receive a notification of successful activation.

		
A.Click on "**Activate**"	B.Automatically Obtain Activation Code	C.Activation Successful

Chapter IV Device Management

4.1. Function Overview

Once the device is activated and successfully connected, the APP's device management interface will display relevant information about the device.



① SN: The SN number of the connected device;

② Device storage: The remaining storage space inside the device;

③ Camera storage: The remaining storage space of the external camera;

④ Project management: Allows for data management, such as deletion, copying, repair, etc.

⑤ Activation status: Displays whether activated or not, and allows activation if not activated;

⑥ Firmware information: Allows for offline and online firmware activation of the device and updates of external camera calibration parameters;

⑦ Equipment diagnosis: When the product is powered on, it performs an initial diagnosis of the device, displaying the connection status of components;

⑧ Connected: Displays the name of the connected WiFi;

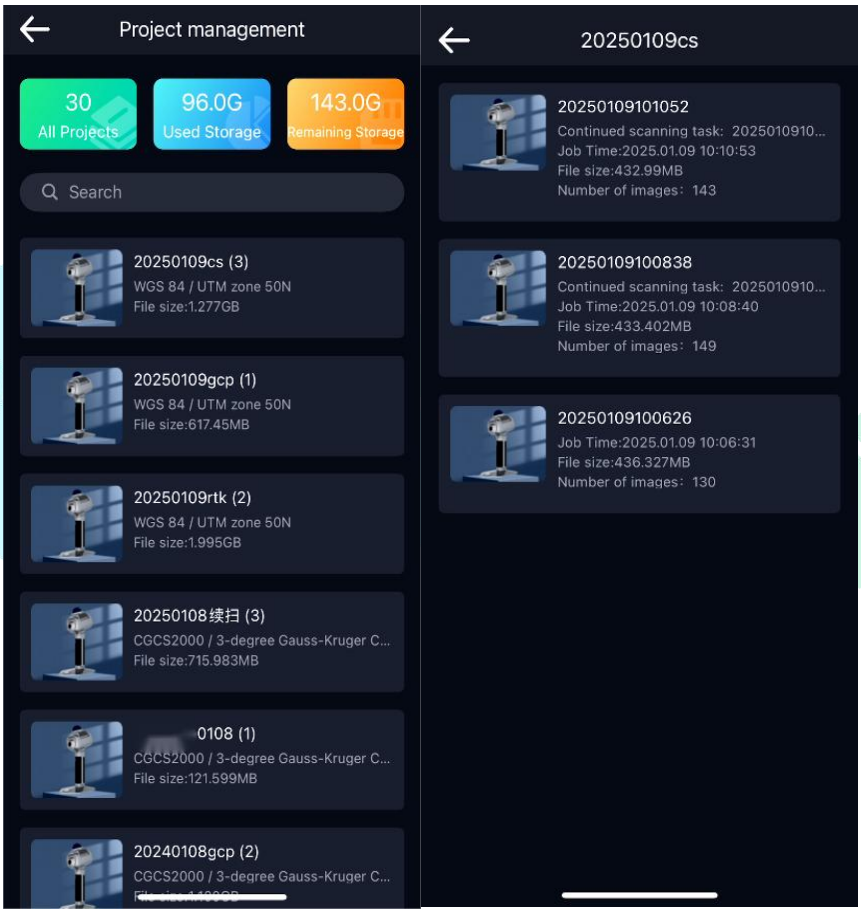
⑨ Start Operation: Enter the Collection Management interface;

⑩ Disconnect: Exit the current login status to allow other clients to connect (only applicable to O1 Lite/H Series, V100 devices).

4.2. Project Management

Under the "**Project management**" tab, you can perform operations such as data copy, memory view, data search, and project deletion.

Above the "**Project management**" tab, the number of projects stored internally on the currently connected device is displayed, along with the memory occupied by existing data and the remaining available memory.

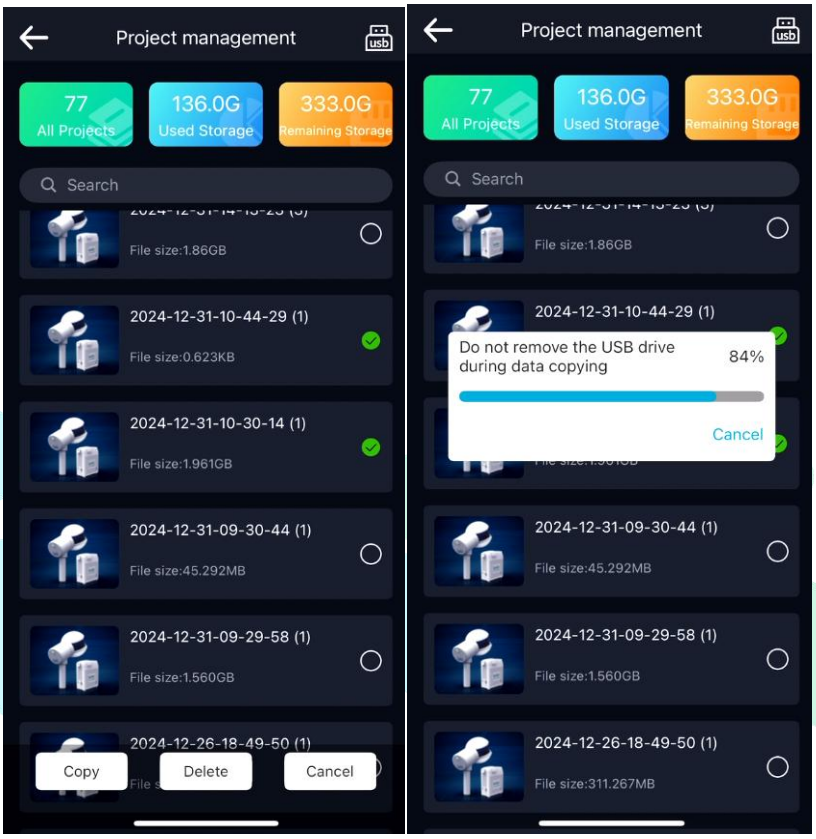


4.2.1.Data Copy

First, insert the USB flash drive into the USB port of the device host (please use a USB flash drive formatted in exFAT or NTFS to copy data, as some USB flash drive formats do not support copying a single file larger than 4 GB), click on a project in the project list, and you will be prompted to copy the project to the USB flash drive; You can also long press to select multiple projects, click "Copy" to copy the data to the USB flash drive. During the copying process, there will be a progress bar. Wait for the progress bar to complete. Once

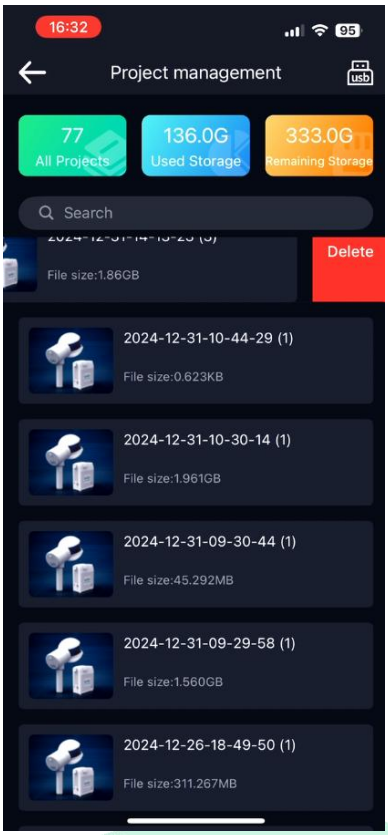
copying is complete, it will display "Project copy successfully". Click OK, click the USB flash drive icon, then eject the USB flash drive.

Note: The USB flash drive should only be inserted when copying data. Do not insert it when powering on or collecting data.

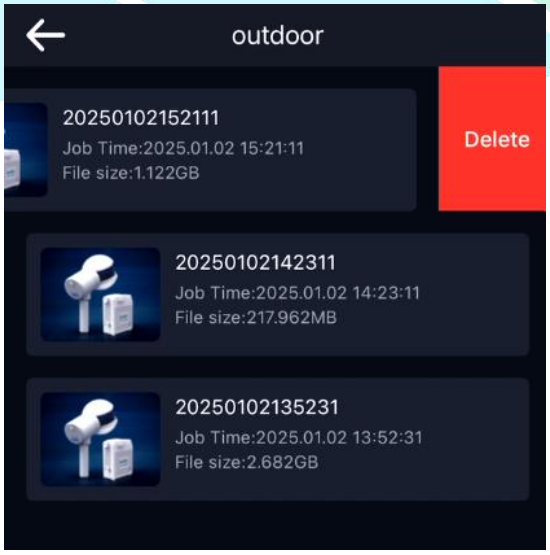


4.2.2.Data Deletion

Swipe left on a project to see the delete button. Click "Delete" and it will prompt "Confirm delete project:* ** ". Click "OK" to delete unnecessary projects from the device. Or long press a project, then you can select multiple projects for batch deletion.

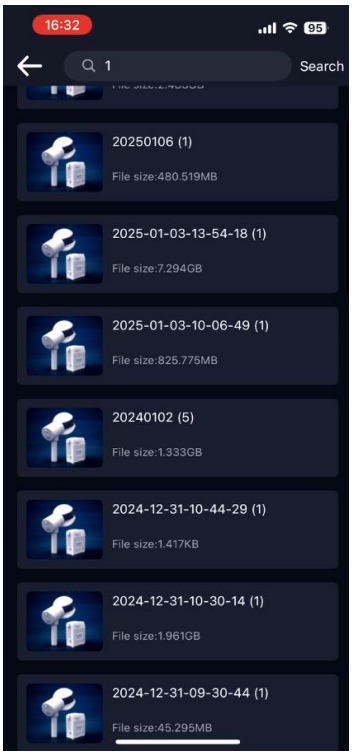


When you need to delete a specific mission data within a project, you can enter the project to delete it individually.



4.2.3.Data Search

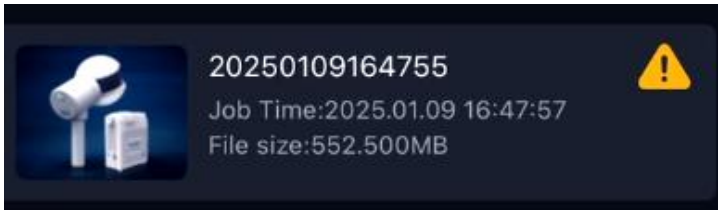
In the search bar, enter the project name keyword to search for the collected projects. Click on a project to perform data copy and deletion.

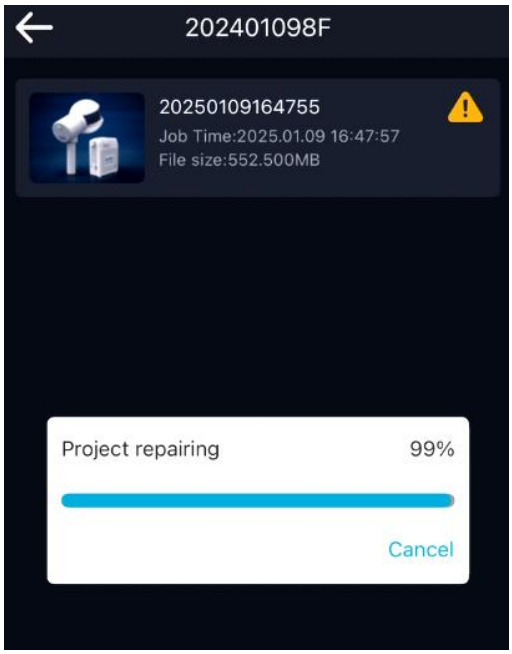


4.2.4.Data Repair

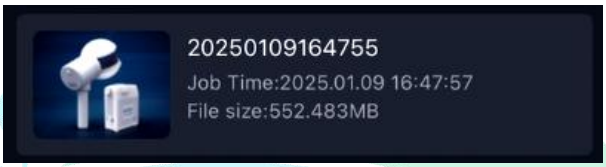
If a collection issue occurs during the collection process or there is a sudden power outage, we can use the data repair function to restore the data before the issue occurred.

Problematic data will display an icon in the upper right corner. We can click it to repair the data.





After the repair is completed, there will be no display.

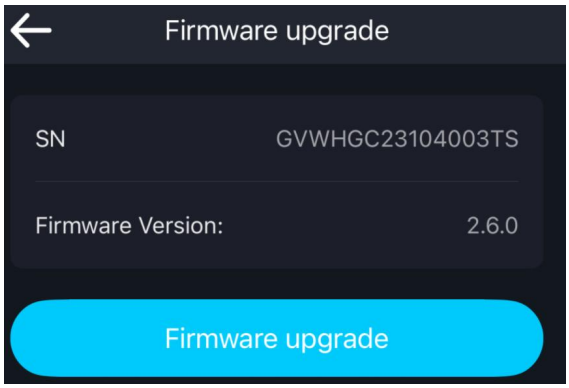


4.3. Activation Status

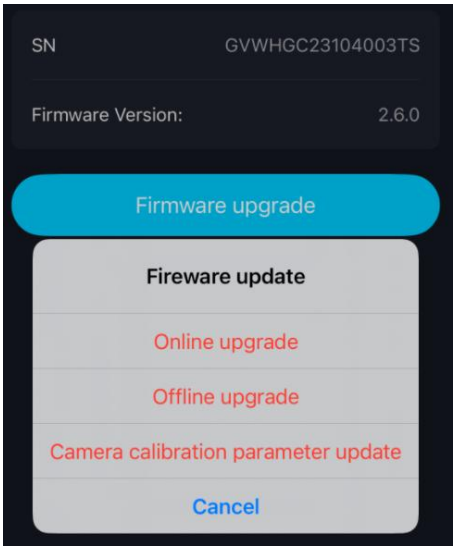
For the activation operation of the device, please refer to Chapter 3.

4.4. Firmware Information

You can perform online and offline updates of the firmware as well as updates of the camera calibration parameters.

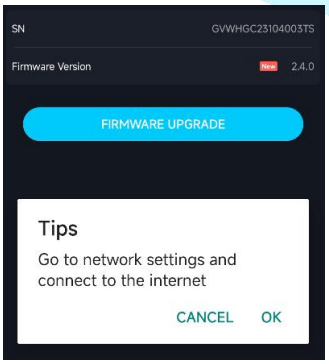
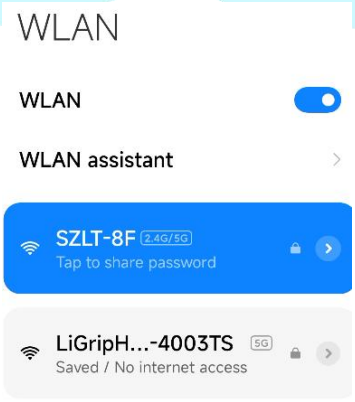
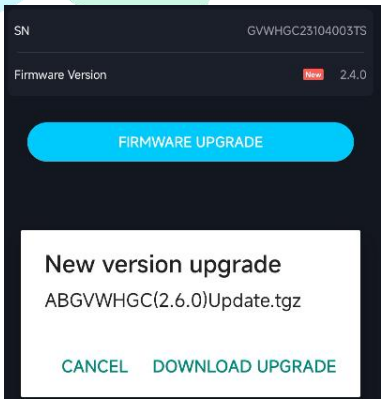


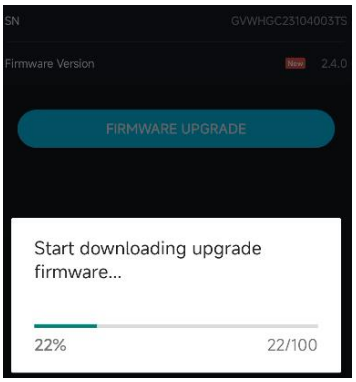
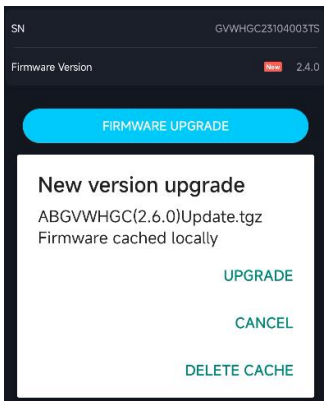
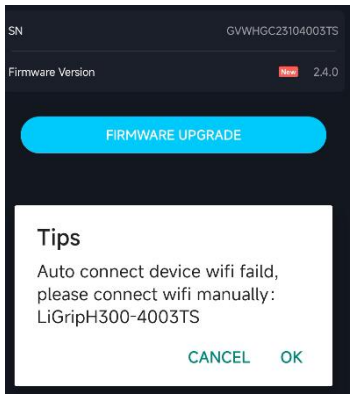
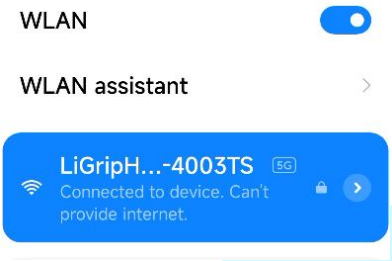
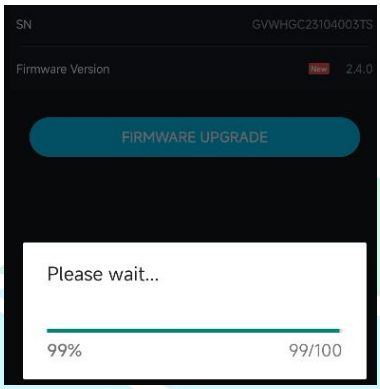
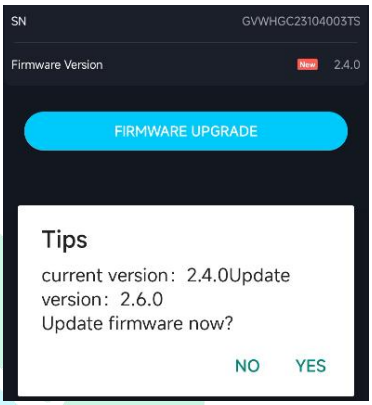
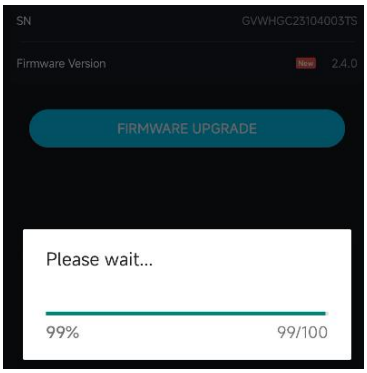
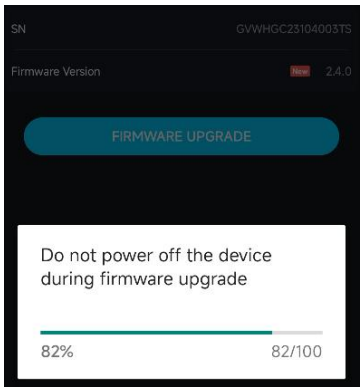
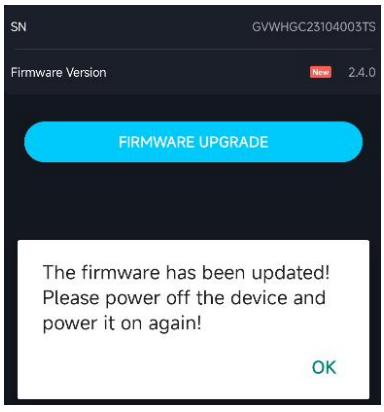
Click "**Firmware Upgrade**" to perform the relevant operation;



4.4.1.Online Upgrade

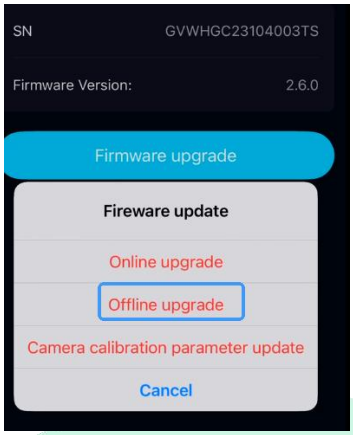
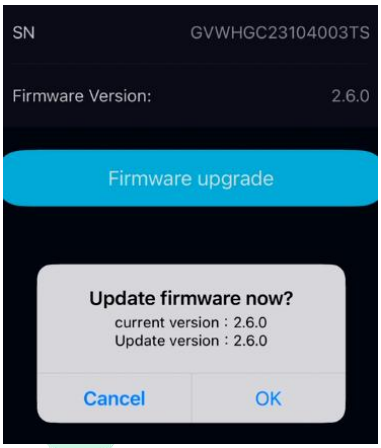
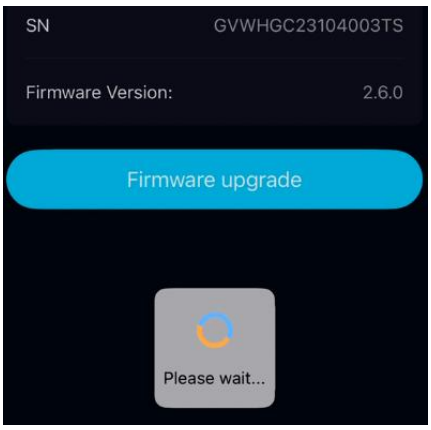
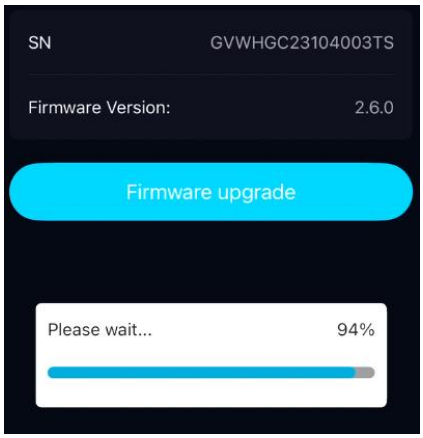
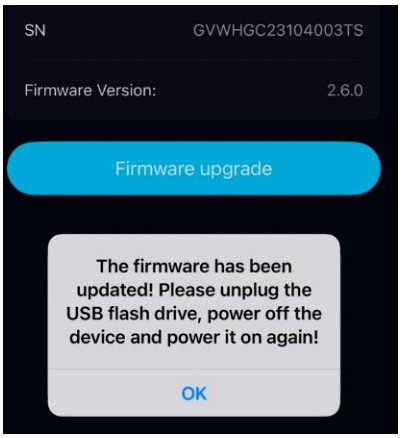
If you choose the "**Online Upgrade"** method, first ensure that the phones can connect to 4G networks (**O2 series devices do not need to switch networks back and forth, while other devices need to switch networks back and forth to complete the firmware online upgrade. The following example is for non-O2 devices**). After clicking "**OK"**, the latest firmware will be obtained from LiCloud via the internet. When a new version of the firmware package is detected, you will be prompted to download and upgrade it. The firmware will then be downloaded to the mobile device.

		
A.Prompt to connect to a 4G external network	B.Connect to an external network with internet access	C.New firmware version detected, click "**Download Upgrade"**

		
D.Download new firmware	E.Successfully cached locally	F.After clicking "**Upgrade**", a prompt to connect to the device's WiFi appears
		
G.Connect to the device's WiFi	H.Wait for the firmware to upload to the device	I.The APP notifies the current and updated firmware version information
		
J.After clicking "**YES**", wait for the upgrade progress	K.Firmware uploading, do not power off	L.After the firmware update is complete, restart the device to complete the firmware update

4.4.2.Offline Upgrade

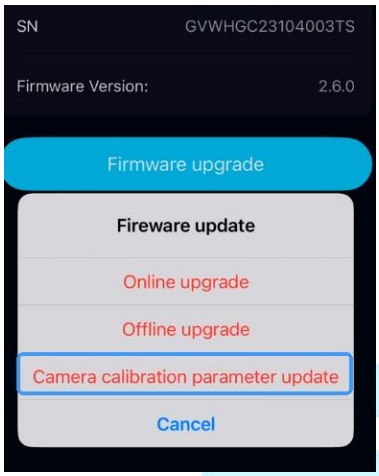
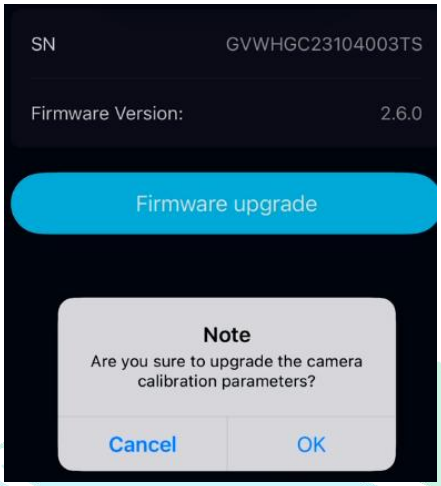
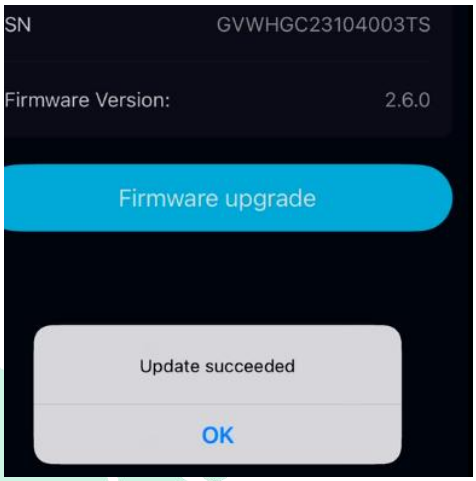
Offline Upgrade: Ensure the APP is connected to the LiGrip device, and the firmware package is placed in the root directory of the USB flash drive. Insert the USB flash drive into the USB interface of the LiGrip main unit. At this point, you can select "**Offline Upgrade**" in the APP firmware upgrade interface. The device will detect the latest firmware package in the USB flash drive and then upload it to the device host for automatic installation and upgrade.

<table>
<tr><td>
</td><td>
</td><td>
</td></tr>
<tr><td>A.Place the firmware package in the root directory of the USB flash drive, and insert it into the device's USB port or Type-C port.</td><td>B.Select "Offline Upgrade".</td><td>C.Confirm the firmware version, and select "OK" to proceed with the upgrade.</td></tr>
<tr><td>
</td><td>
</td><td>
</td></tr>
<tr><td>D.The system will automatically upload the firmware.</td><td>E.Firmware upgrading in progress.</td><td>F.After the firmware update is complete, restart the device to complete the firmware update.</td></tr>
</table>

Note: Do not boot the device with the USB flash drive inserted.

4.4.3.Camera Calibration Parameters Upgrade

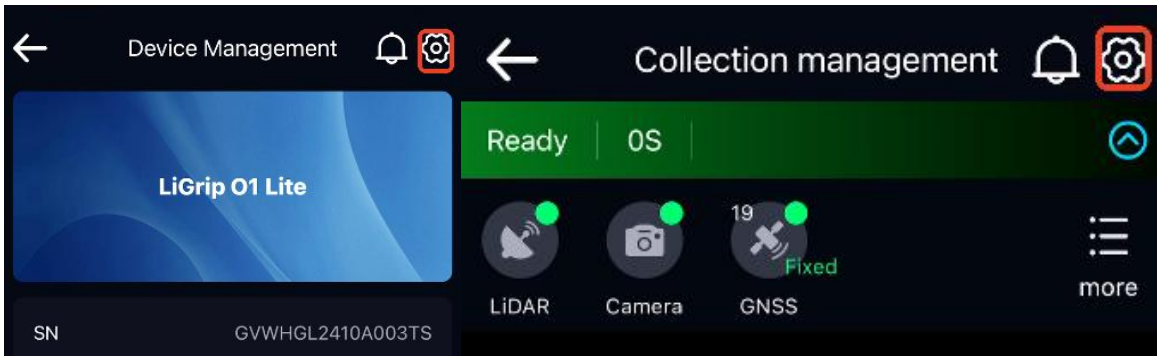
Ensure the APP is connected to the LiGrip device, and the **IMCAB.T** file is placed in the root directory of the USB flash drive. Insert the USB flash drive into the USB interface of the LiGrip main unit. At this point, select "**Camera calibration parameter update**," and the device will detect the IMCAB.T file in the USB flash drive, then upload it to the main unit for automatic camera calibration parameters upgrade.

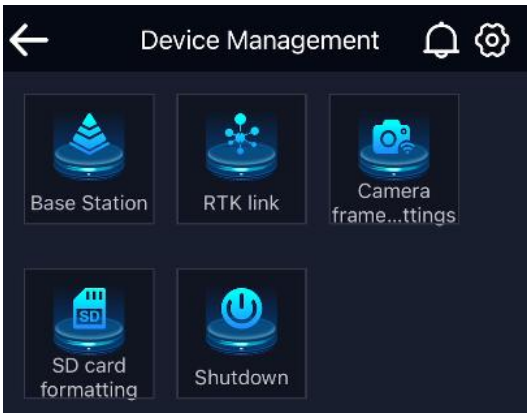
		
A.Select Camera Calibration Parameters Update	B.Click "**OK**" to update camera calibration parameters	C.Wait for the reminder to succeed, then restart the device.

Note: For detailed camera calibration procedures, please refer to the LiDAR 360 MLS User Manual.

Chapter V System Settings

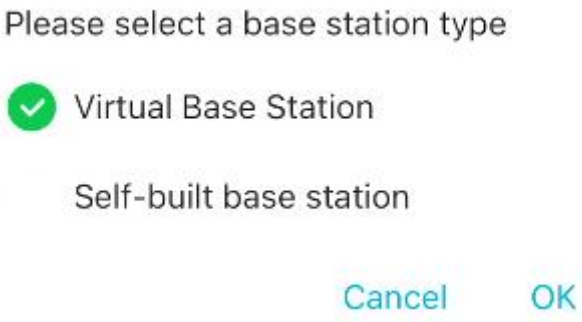
System settings mainly involve RTK configuration, camera frame rate settings, SD card formatting, shutdown, and other operations. Click on the top right corner of Device Management or Collection Management to enter system settings.



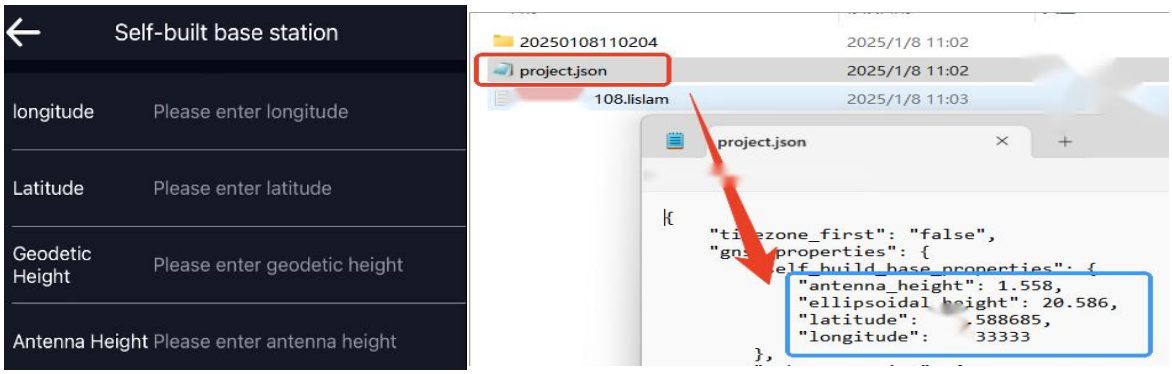


5.1. Base Station

Mainly involves the setup of virtual base stations and the recording of self-built base station coordinates.

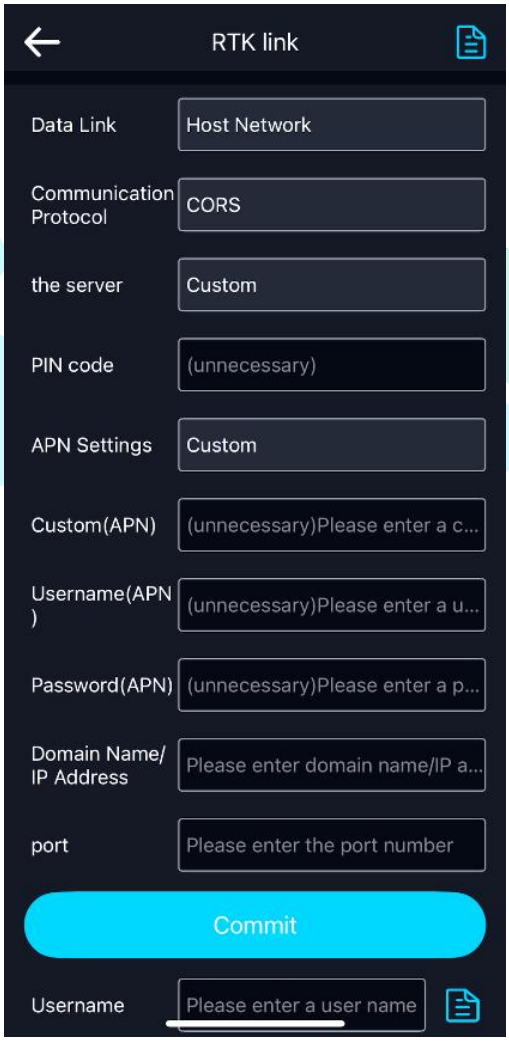


You can record the coordinates of the self-built base station, which are saved in the project.json file.



5.2. RTK Link

Click on "**RTK link**" to enter and configure the RTK link according to the actual situation.



Note: The RTK link settings are only supported by certain models.

① Data link: Default is the host network.

② Communication protocol: Default is CORS.

③ The server: Custom.

④ PIN code: Some SIM cards have a PIN code lock. You need to contact the operator who provided your SIM card and fill it in here.

⑤ APN Settings: Custom.

⑥ Custom(APN): Optional. If the SIM card requires an APN account to access the internet, it needs to be configured according to the APN provided by the carrier.

⑦ Username(APN): Optional. If the SIM card requires an APN account to access the internet, it needs to be configured according to the APN provided by the carrier.

⑧ Password(APN):Optional. If the SIM card requires an APN account to access the internet, it needs to be configured according to the APN provided by the carrier.

⑨ Domain/IP address: Refers to the domain/IP address of the currently logged-in CORS account. The domain/IP address varies for different servers.

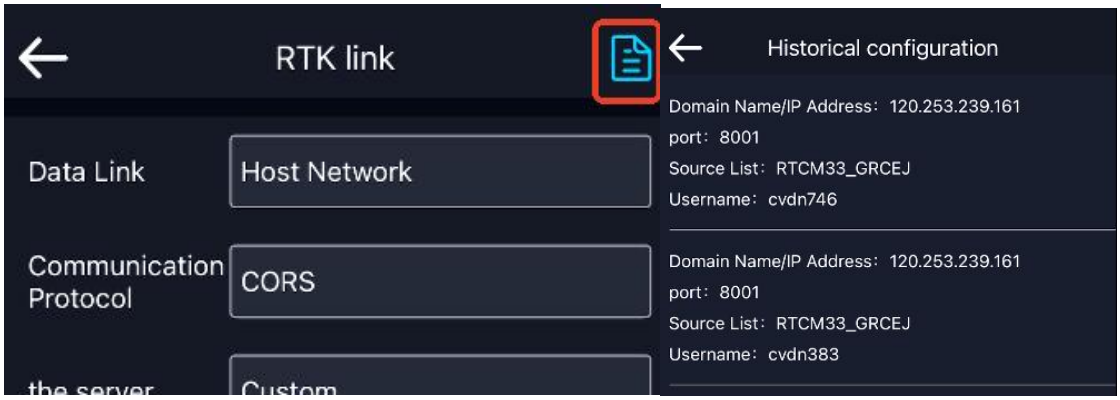
⑩ Port: Users can select/input different ports based on the actual coordinate system requirements.

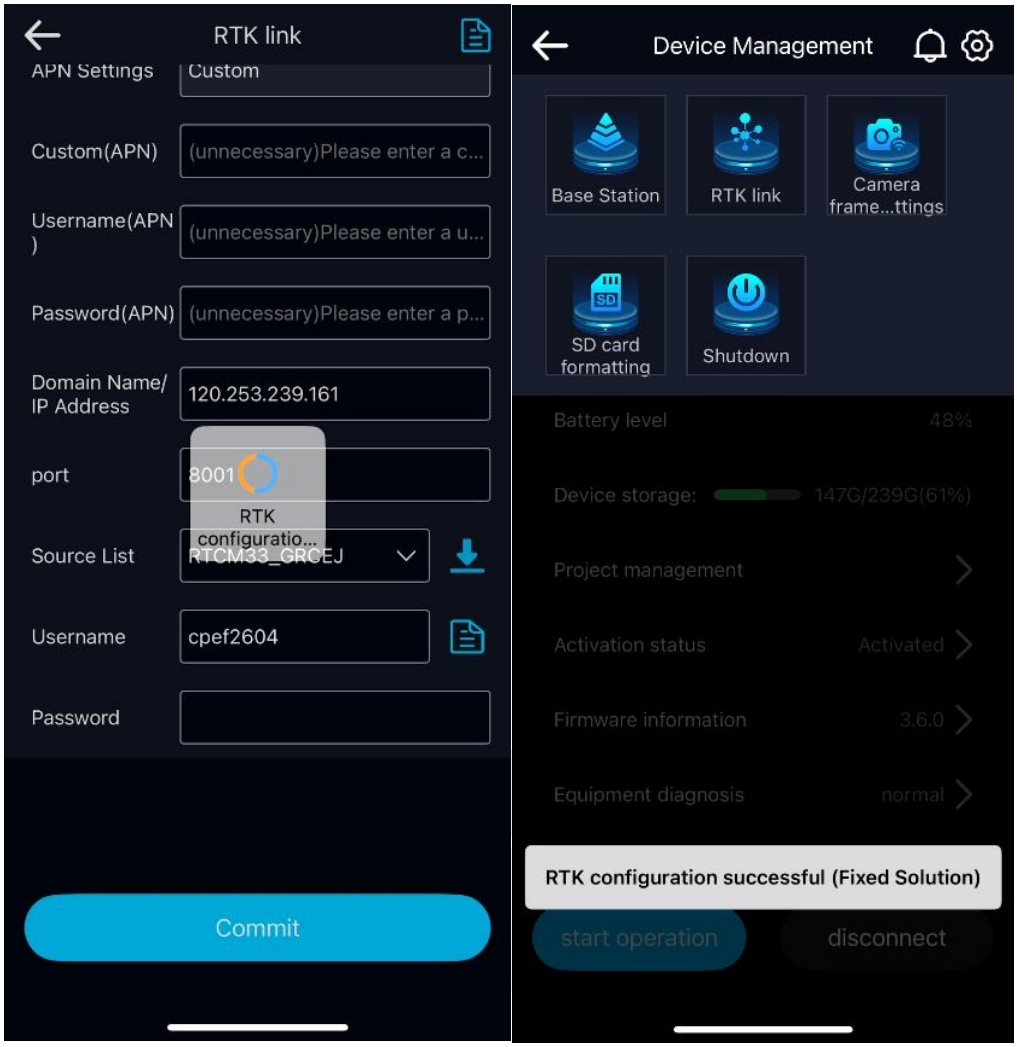
⑪ Source list: Users can select/input different source lists based on different differential requirements, or they can automatically download the source list.

Note: The source list can only be downloaded after entering the IP and port number.

⑫ Username/Password: Refers to the CORS account and password for logging into the server. You can also choose previously configured accounts and passwords.

For servers that are custom-selected and successfully configured, you can directly call the historical configuration records for quick configuration the next time.

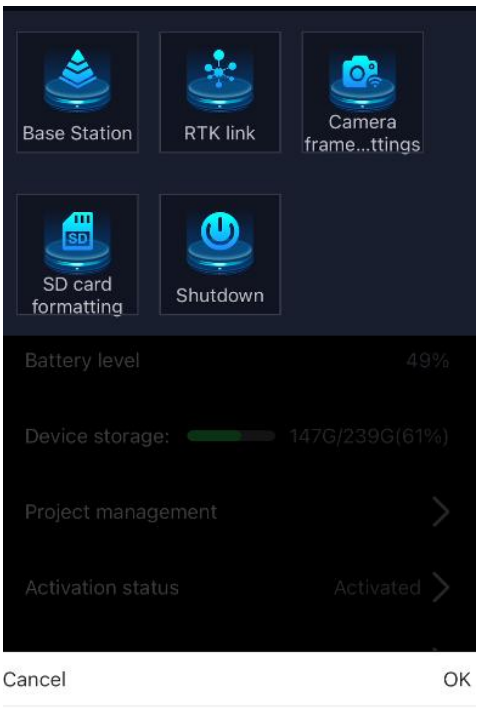


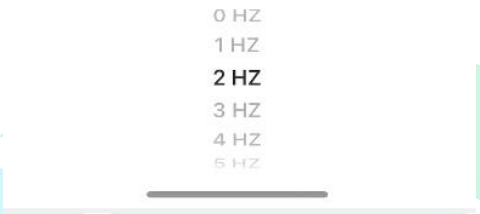


After the RTK module is successfully configured, it will prompt and voice broadcast "**RTK configuration successful**."

5.3. Camera Frame Rate Settings

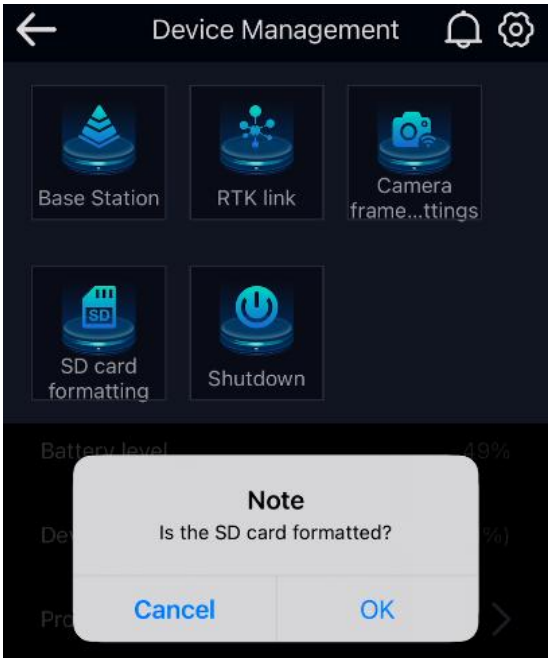
The camera frame rate settings only support the built-in camera models (O series) and allow adjustment of frame rates from 0-5 Hz. 0 Hz means no photos are taken.





5.4. SD Card Formatting

You can format the internal storage of the device, but proceed with caution.



5.5. Shutdown

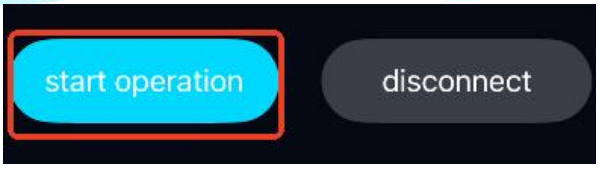
For O series products, after shutdown, the device completely powers off automatically (including the battery).

For H/V/Backpack series products, after shutdown, only the system shuts down, and the battery is not disconnected.



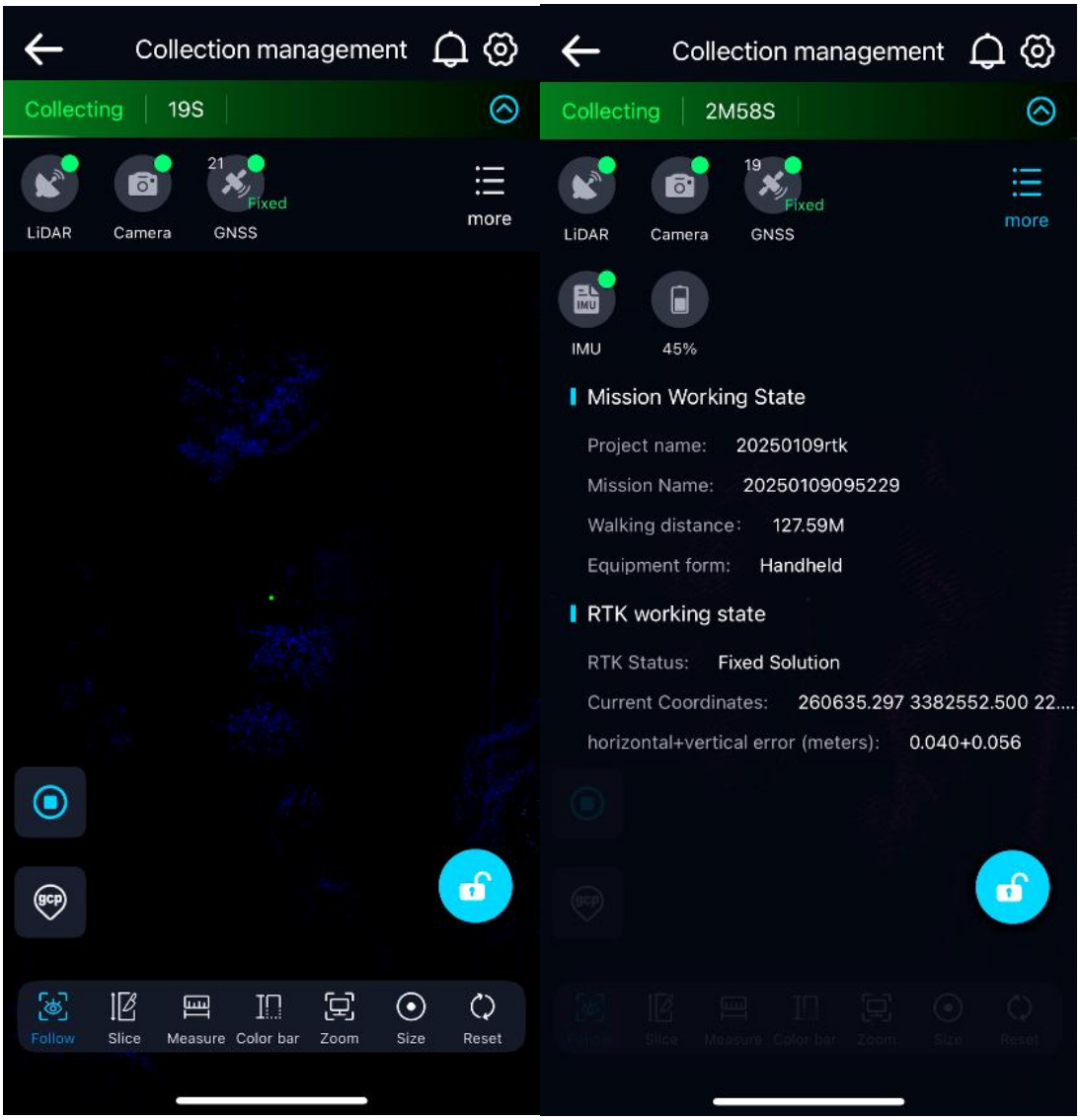
Chapter VI Collection Management

Click the "**start operation**" button on the 'Device Management' interface to enter the Collection Management page.



Collection Management mainly involves data collection, while also displaying real-time point cloud and trajectory, current coordinates, walking trajectory distance, RTK status, and device status.

6.1. Working Status



6.1.1.Collection Status Bar

Five statuses: Ready, Preparing for Collection, Collecting, GCP Collecting, and Stopping Collection.

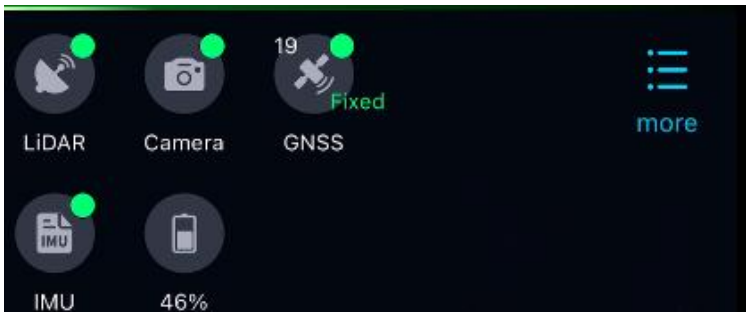


6.1.2.Component Status

Green dot indicates connected and normal, yellow dot indicates connected but no data, red dot indicates not connected. For the display of satellite status, the top left corner shows the number of satellites, and the bottom right corner shows the RTK status (Fixed Float Single).

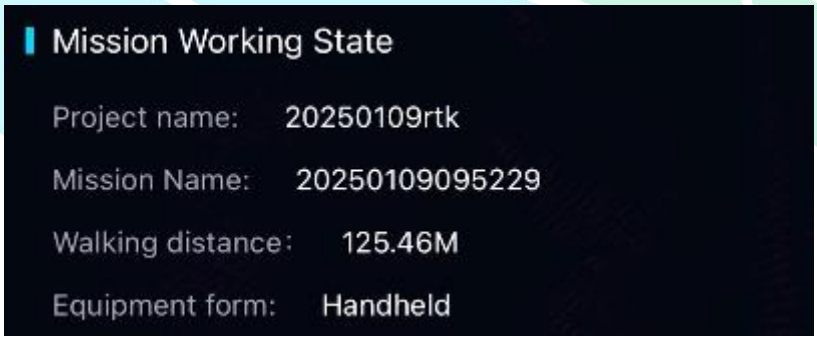
For the LiBackpack/O series handheld, battery information will also be displayed.





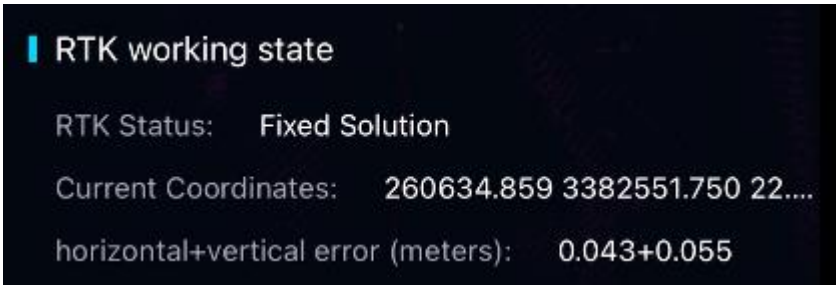
6.1.3.Mission Working Status

The device working status mainly displays: the name of the project, the name of the current task being collected, the distance walked, and the form of collection.



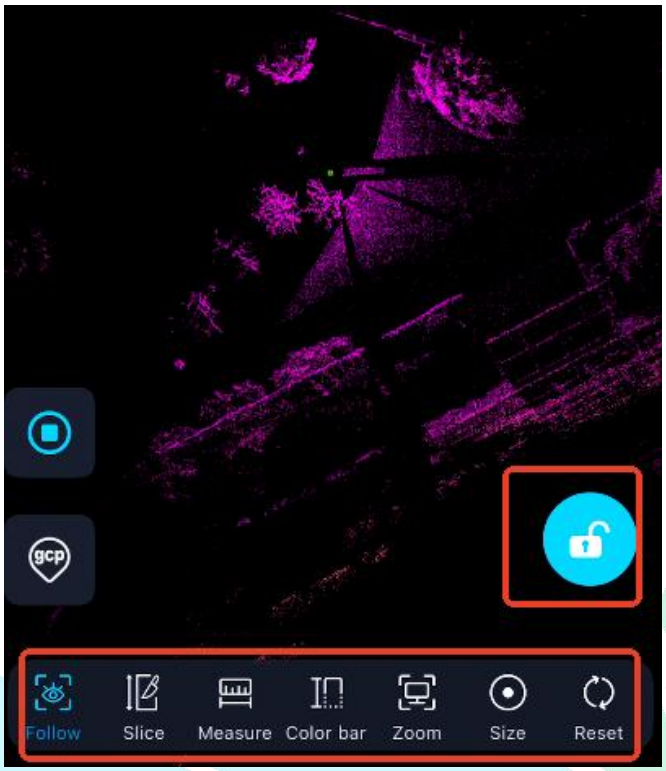
6.1.4.RTK Working Status

Mainly displays the RTK status (fixed solution, float solution, single solution), the current GPS coordinates, and the standard deviation of the plane and elevation.



6.2. Real-time Point cloud Control

Real-time point cloud control is mainly for customers to conveniently browse the 3D point cloud and perform operations such as measurement, slicing, resetting, and other operations.



6.2.1.Follow

Automatically follows the point cloud data and trajectory in the current state of travel, controlled independently by the current travel route of the device, and can view the trajectory in the current state.

At this time, the interface cannot be translated or rotated. Click the function again to exit, and then App will show pan and rotate buttons;

6.2.1.1.Pan

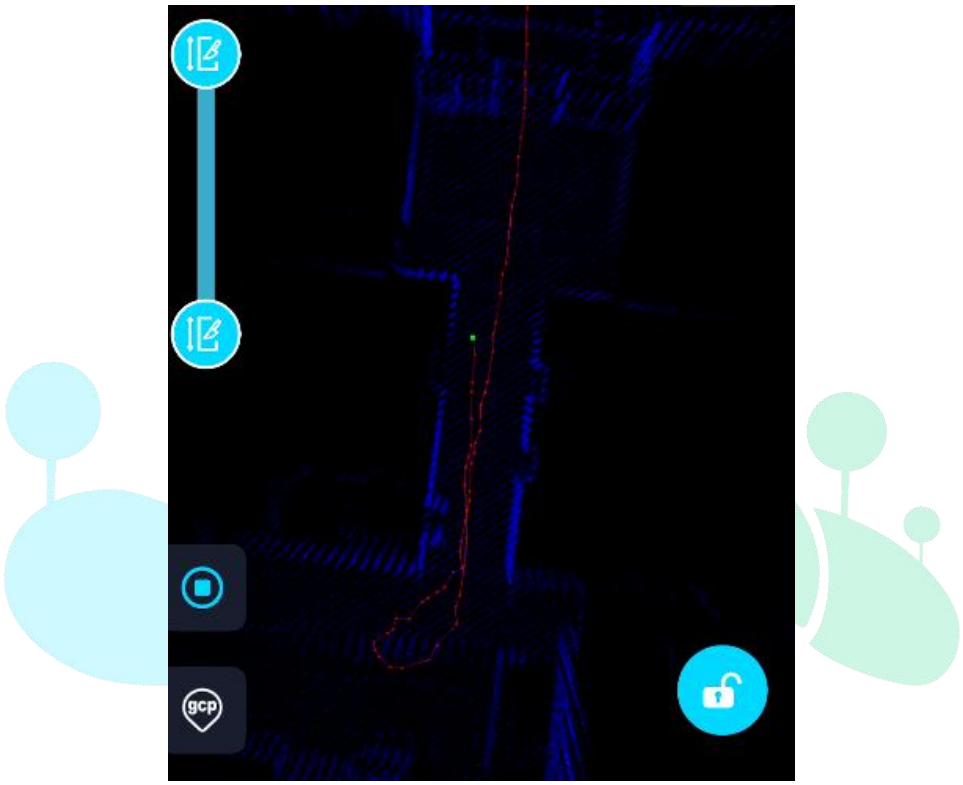
After clicking the button, you can pan the point cloud data in the real-time point cloud interface.

6.2.1.2.Rotate

After clicking the button, you can rotate the point cloud data in the real-time point cloud interface.

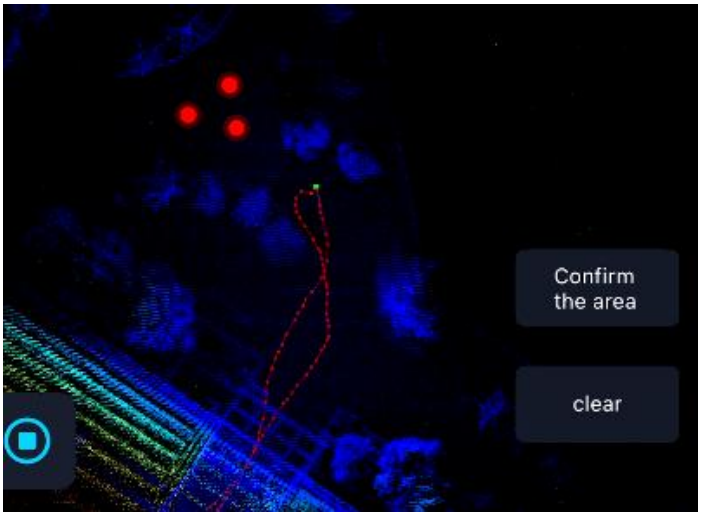
6.2.2.Slice

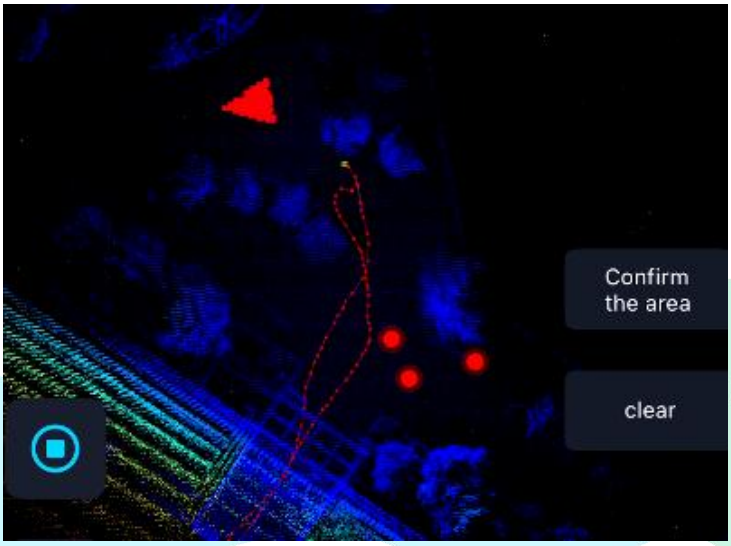
The real-time point cloud can be displayed with elevation slicing.

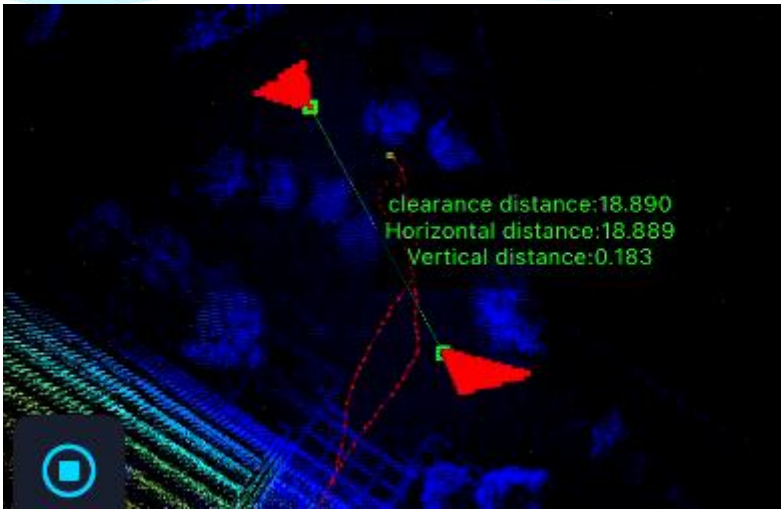


6.2.3.Measure

Measure distance (clearance distance, horizontal distance, vertical distance) by setting 2 areas (each area consists of 3 points).

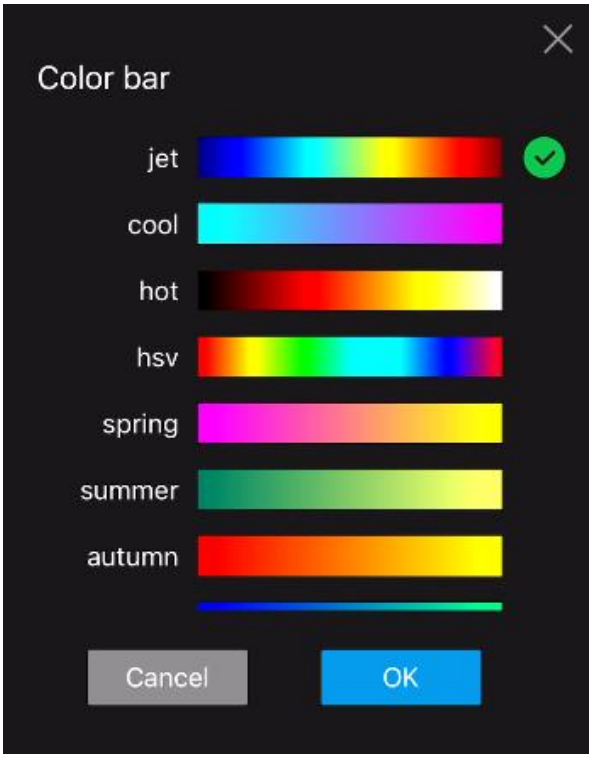






6.2.4.Color bar

The real-time point cloud is rendered according to the selected color bar to enhance display effects.

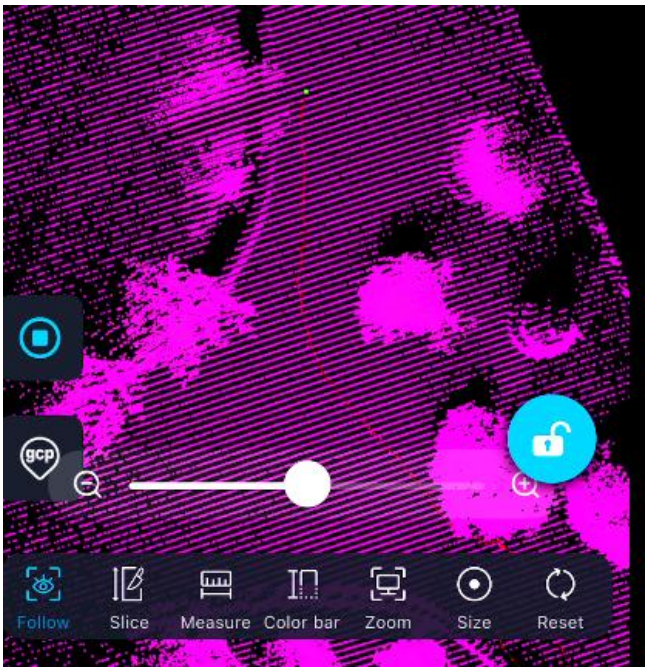


6.2.5.Zoom

Display the data globally.

6.2.6.Size

You can adjust the display point size of the real-time point cloud.

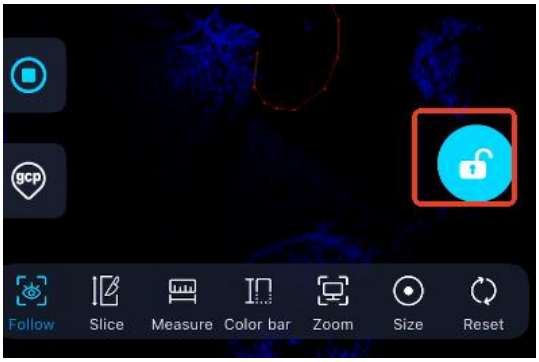


6.2.7.Reset

Clear the displayed point cloud on the screen and re-display the real-time point cloud data.

6.2.8.Lock Screen

You can lock the screen to prevent accidental touches.



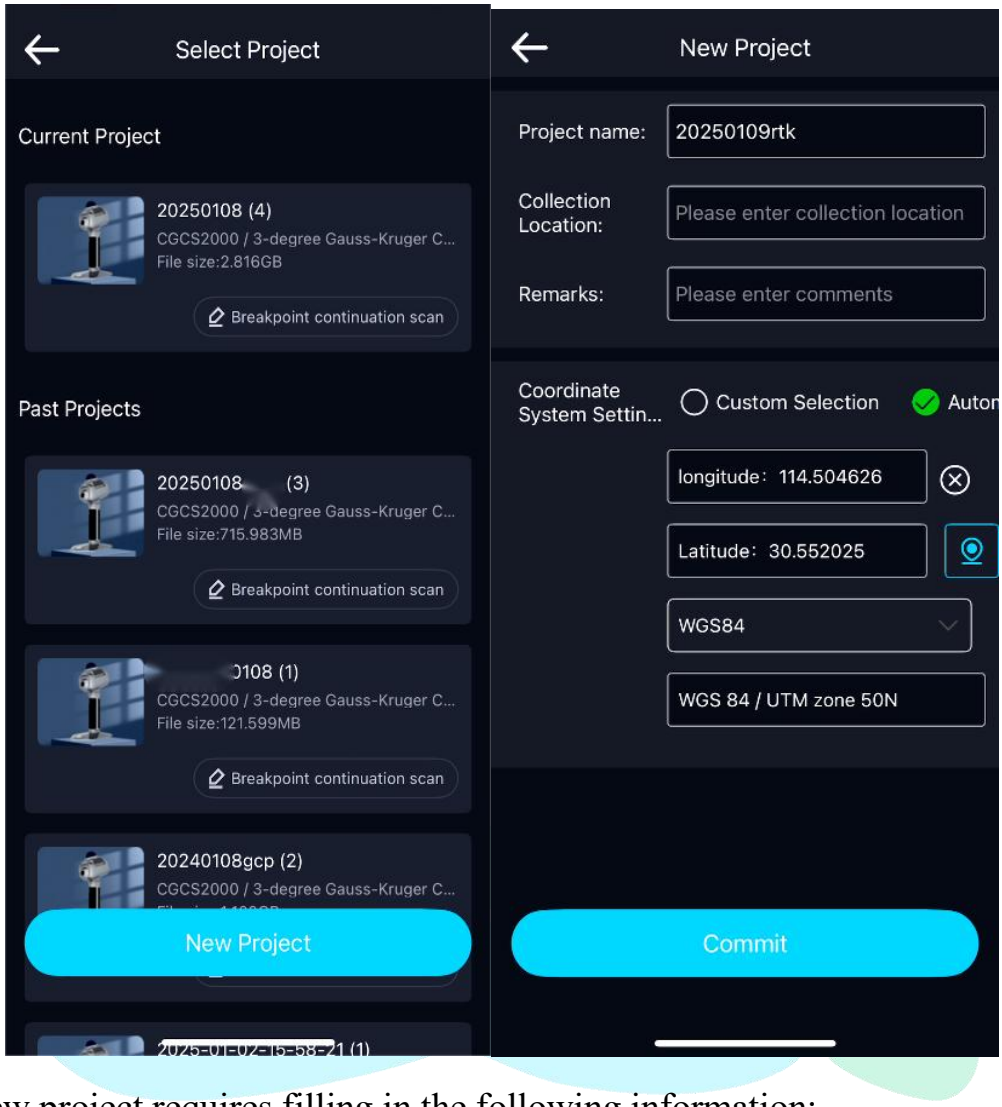
After locking, you can long press for 3 seconds to unlock.



Chapter VII Start Operation

7.1. Create New Project

Click the start collection  on the collection control interface to enter the "**Select Project**" interface, where you can choose a historical project or create a new project.



Creating a new project requires filling in the following information:

① Project Name;

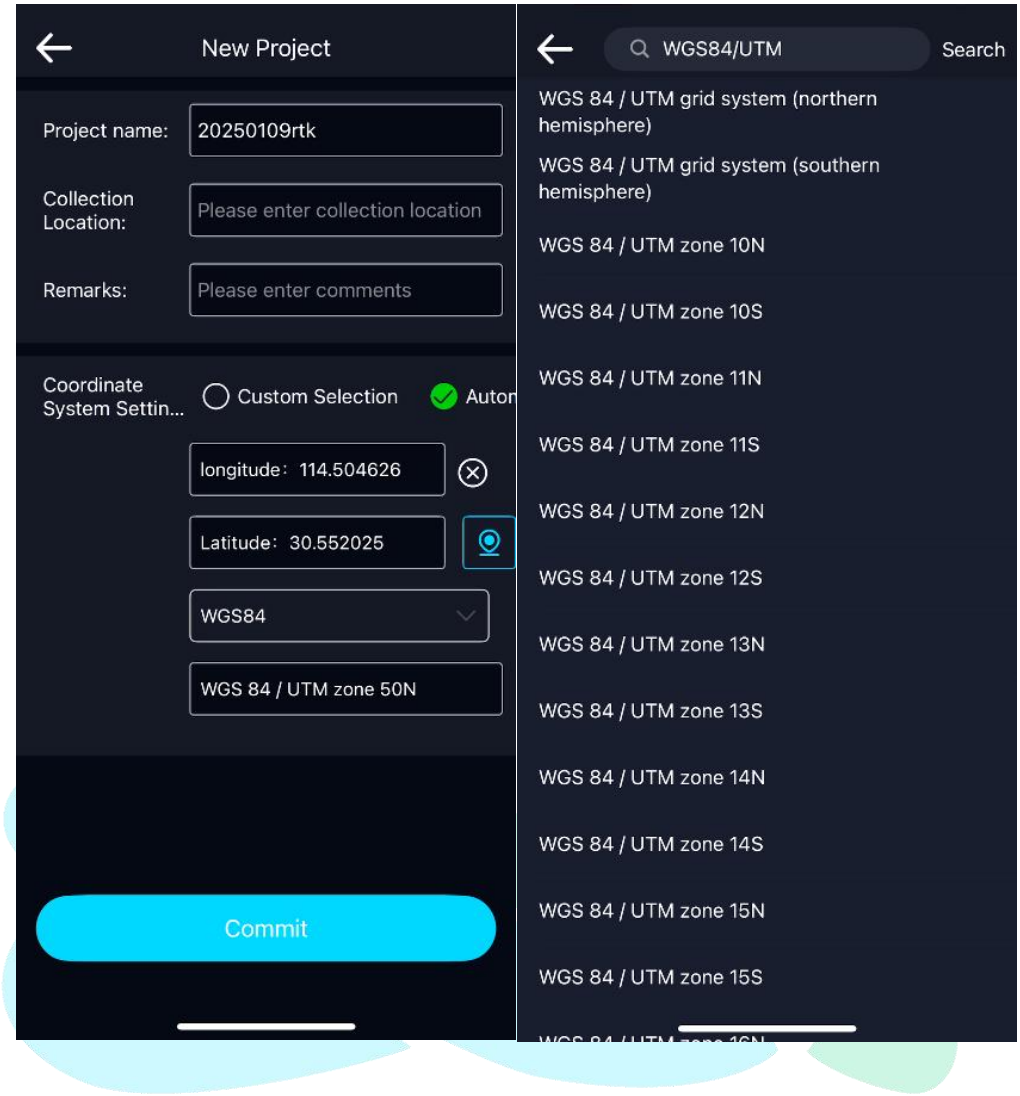
② Collection Location (optional);

③ Remarks (optional);

④ Coordinate system settings: You can customize the search or automatically determine the projection zone of WGS84 or CGCS2000 based on mobile phone positioning;

Note: Automatic determination of the projection zone currently only supports CGCS2000 3-degree zone projection and WGS84 UTM 6-degree zone projection.

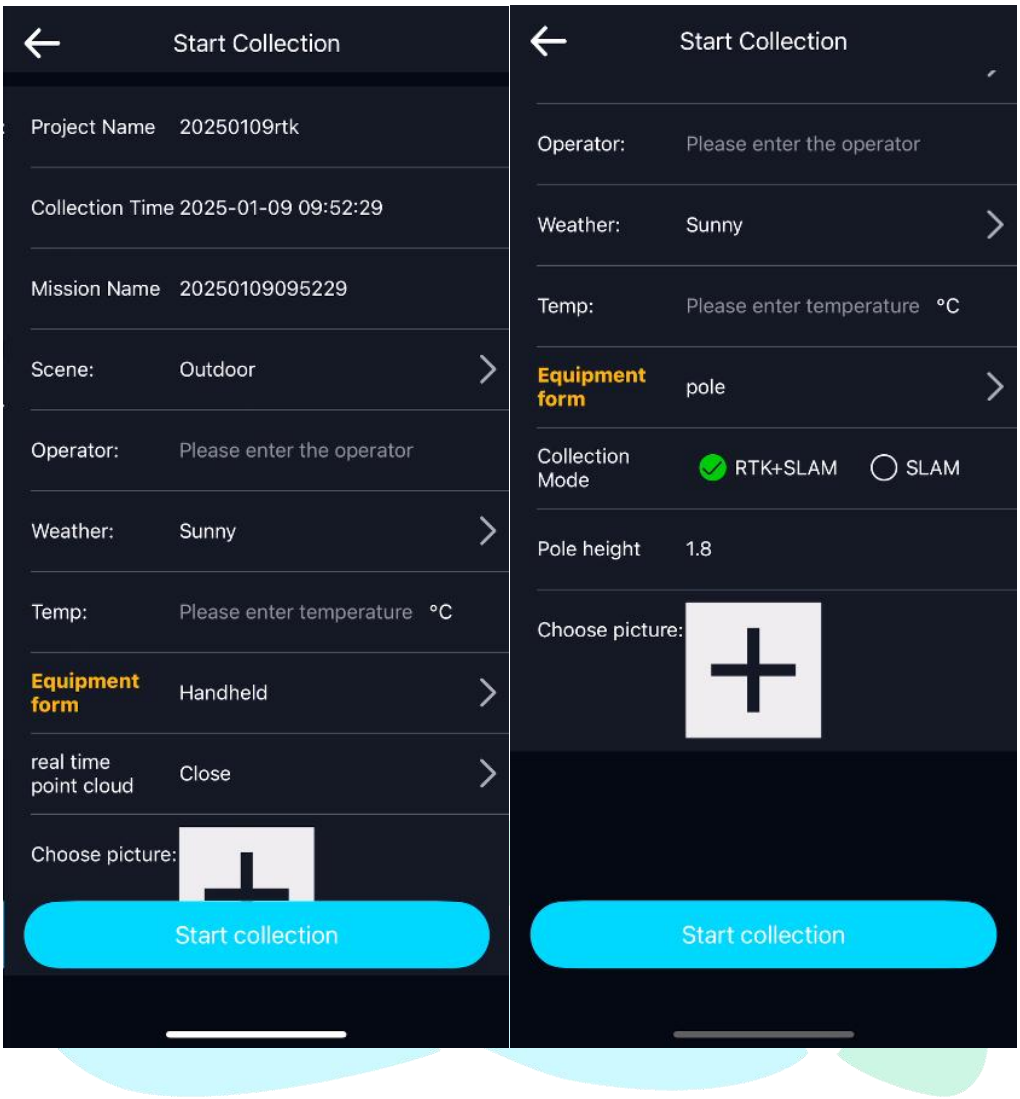
After filling in the above information, click " **Commit**" to complete the creation of the project.



7.2. New Task Collection

In the project selection interface, you can preview the details of the device's historical projects. "**Current Project**" refers to the newly created project, while "**Historical Projects**" refers to previously set projects. After selecting a project, you can enter the "**Start Collection**" page, which contains the following information:

Note:The settings of different device models are not the same, please refer to the APP display



（1）Project Name: Displays the project to which the current collection task belongs;

（2）Creation Time: Displays the time when the current project was created;

（3）Mission Name: The system generates a default task name, allowing users to modify the name of the current collection task. Please try to avoid spaces;

（4）Scene: Select the collection environment of the current scene, including outdoor, indoor, cave, and tunnel;

（5）Operator (optional): Records the current operator;

（6）Weather (optional): Records the current weather conditions;

（7）Temp(optional): Records the current temperature;

（8）Equipment form: Select the mode of the device during operation, including handheld, backpack, airborne, car, and pole;

（9）Collection Mode: RTK+SLAM or SLAM, applicable only to the pole mode;

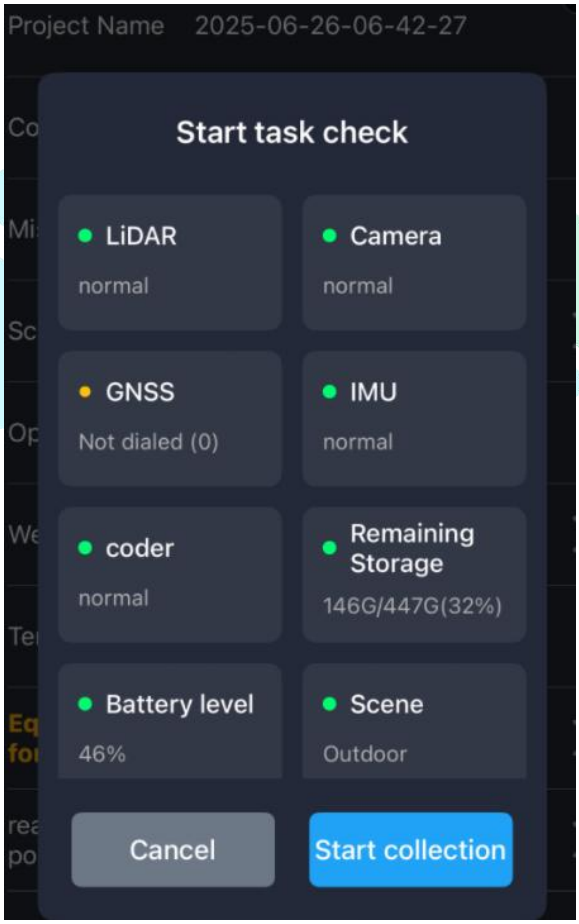
（10）Pole Height: Only applicable to pole mode;

（11）Video Collection Mode: Devices with external cameras need to choose between delay photography mode or video for image collection;

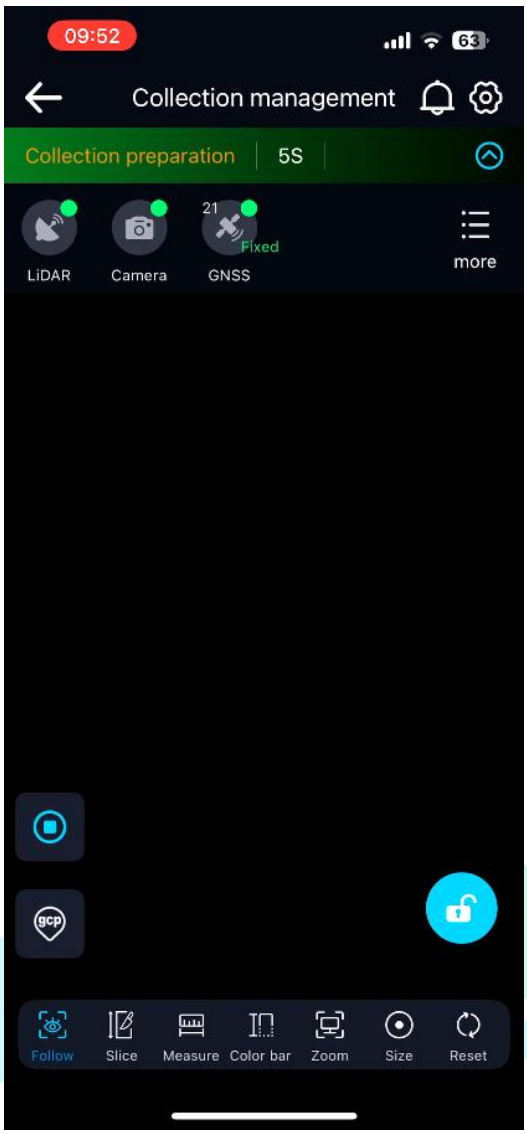
（12）Real-time Point cloud: Open or close;

（13）Choose picture(Optional): You can take a picture of the current collection environment to facilitate subsequent data analysis.

After completing the above content, click "**Start Collection"**, at this time, the APP will pop up the "Start Task Check" interface, where you need to confirm the status of the device (such as battery level, satellite status, storage, etc.). After confirming that everything is correct, click "**Start Collection**".

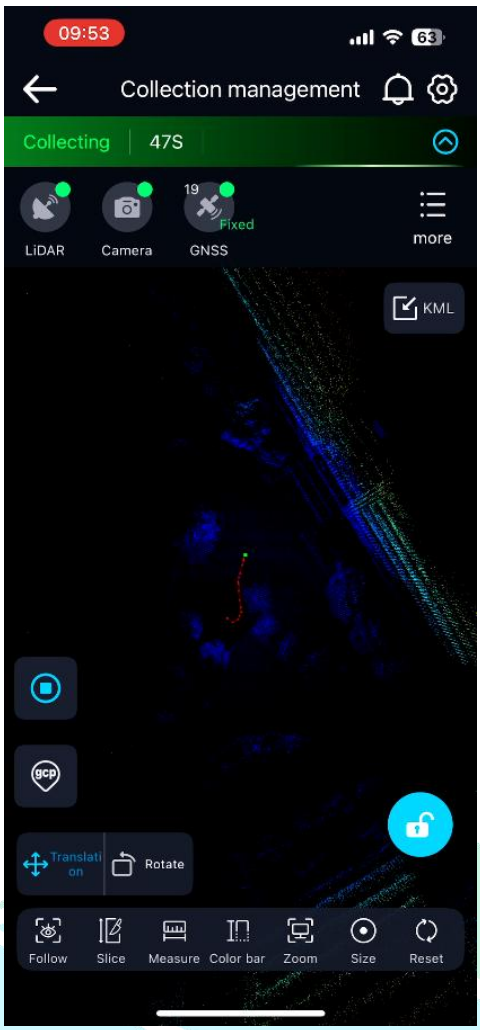


The device will first enter the collection initialization state. At this time, the APP will announce: "**Collection preparation, please wait**."

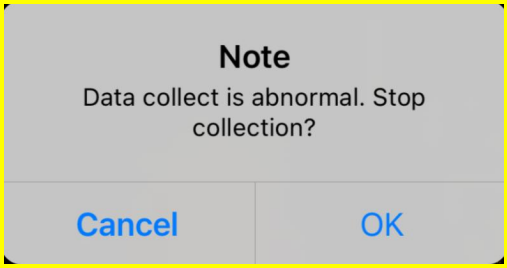


Wait for the APP device status to change to "**Collecting**", and when the voice prompt says" **Device is collecting**", you can slowly pick up the device and start data collection along the pre-planned path. Path planning can refer to the LiGrip User Manual.

During the collection, you can refer to section 6.2 for controlling and browsing the 3D point cloud.



If the APP prompts "Date collect is abnormal. Stop collection?" during the collection process, please stop collecting data and contact technical support or after-sales service for troubleshooting.

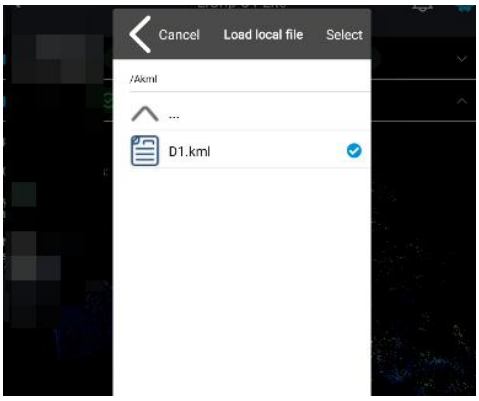


7.3. Import KML

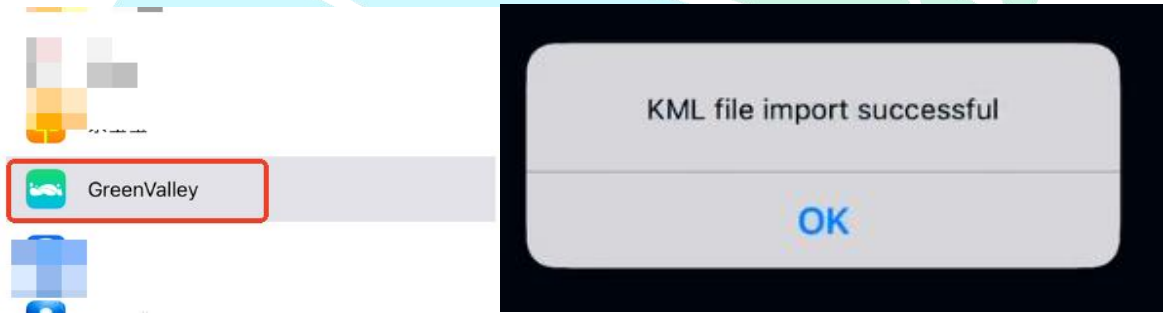
When there is an **RTK fixed** solution, after walking a certain distance during normal collection, an import KML icon 

will appear on the right side of the collection control interface.

For Android: You need to select the KML file from the local phone file directory.



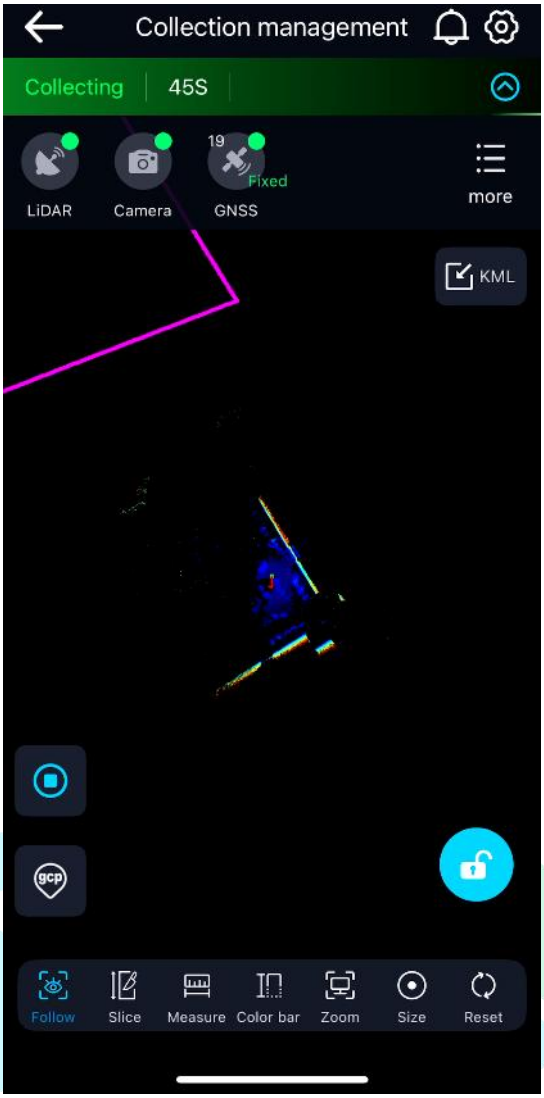
For the IOS system: Before importing a KML file, you should open KML at any location, and choose to open with GreenValley to import the KML file into the GreenValley APP.



Then you need to select the KML file from the GreenValley App.



During the import process, the system will reset the point cloud display, and after the reset is complete, the point cloud and KML file will be displayed again.



7.4. GCP Collection

GCP collection only supports LiGrip handheld devices, including two collection modes: GCP collection in handheld mode and GCP point collection in pole mode.

7.4.1.GCP collection in Handheld Mode

GCP collection in handheld mode is a method to obtain point clouds with absolute coordinates through post-processing without GNSS.

After initialization is complete and a certain distance is walked, click on the collection control interface. At this time, the interface requires entering the name of the point,

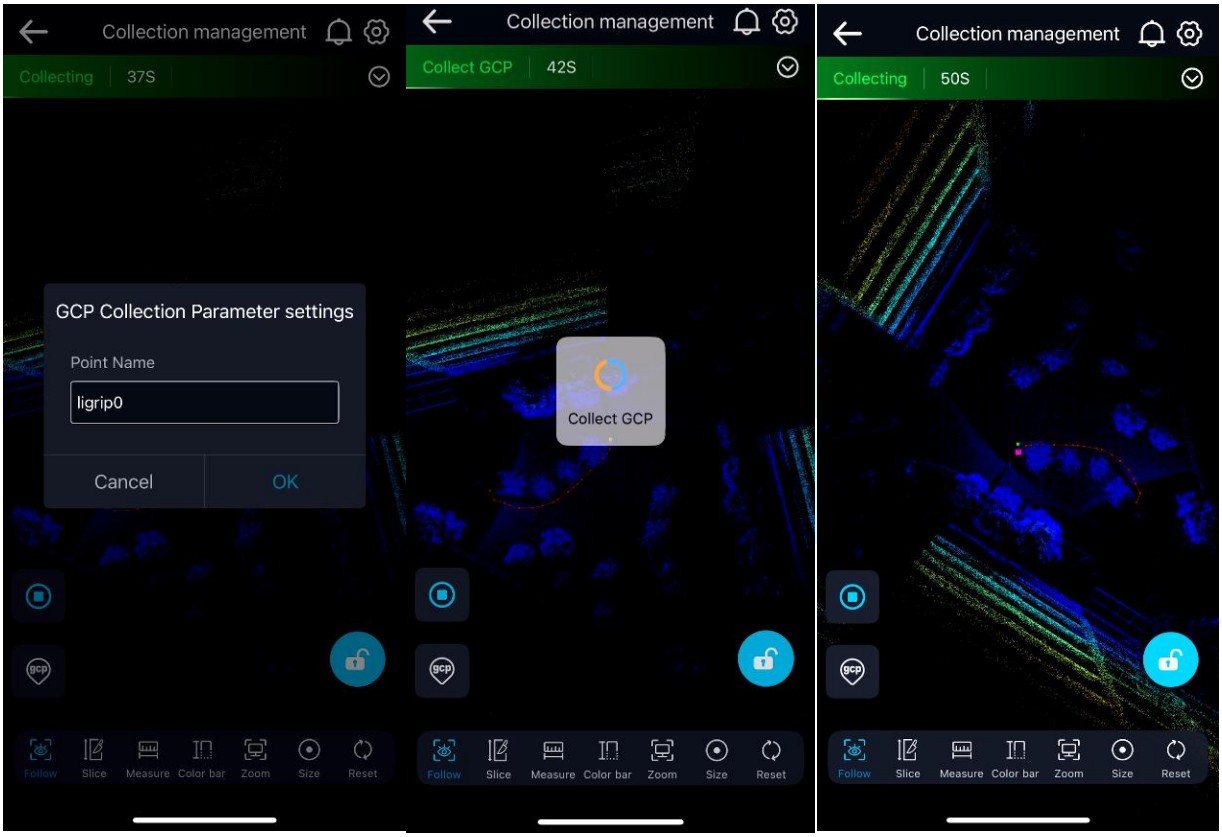
clicking "OK", and the APP will announce "**Collecting GCP, please wait"**. The APP interface displays "Please wait", and the APP device status bar changes to "Pointing".

If the point marking is successful, the APP will announce "**Successful management**", and the 3D point cloud interface will display the 3D position of the point.

If the device fails to mark the point, the APP will announce the voice prompt "**GCP failed**", and you may attempt to mark the point again.

Once the point marking prompt sound has finished and the device status returns to "**Collecting**", you can slowly pick up the LiGrip device to continue data collection.

The other GCP points can be obtained by repeating the above operation.



7.4.2.GCP Collection in Pole Mode

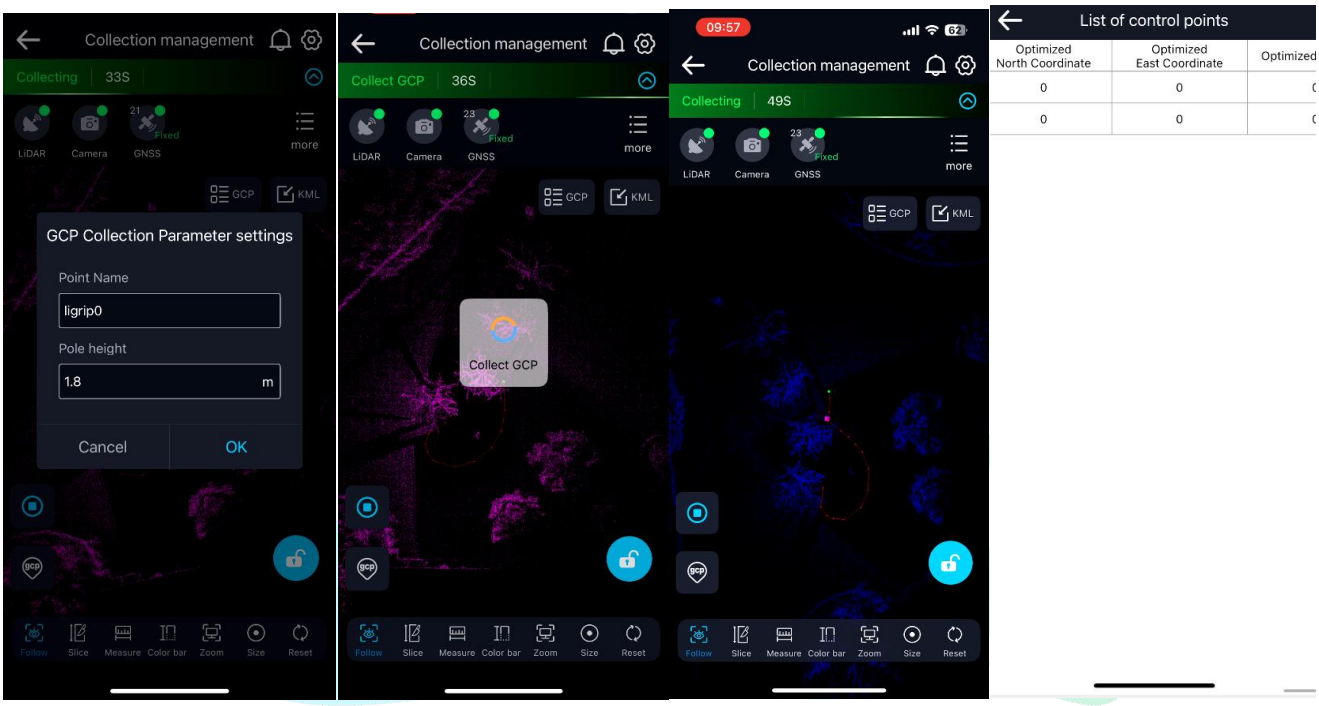
GCP collection in pole mode is divided into two modes: RTK+SLAM collection mode with RTK and SLAM mode.

1）GCP Point Collection in RTK+SLAM Mode

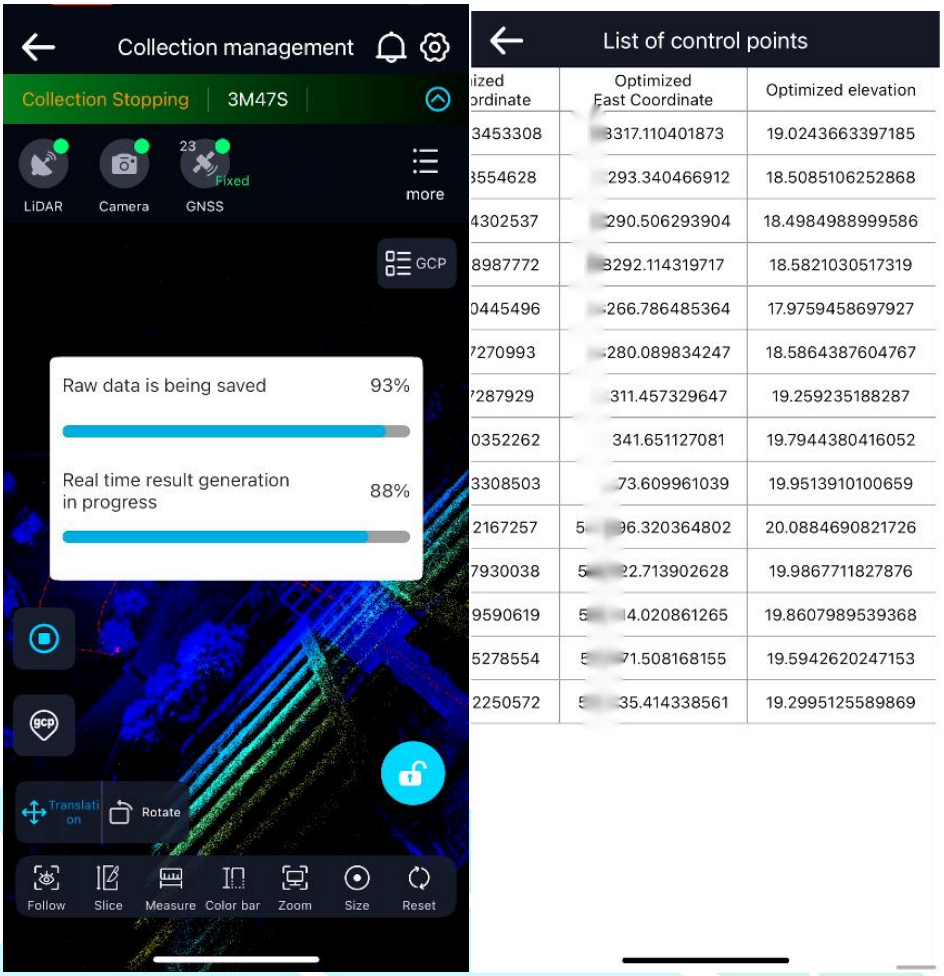
In RTK+SLAM mode, the obtained GCP point coordinates are absolute coordinates.

After clicking, enter the name of the GCP collection and the current pole height. After the GCP collection is completed, click the GCP icon on the right side of the APP to view the pure RTK collection results.

Note: The north-east-elvation coordinates obtained from the GCP collection at this time are not the final results. The final results need to be checked in the optimized coordinate list.



After all RTK+SLAM GCP collections are completed, the real-time program on the handheld device will optimize the coordinates of the GCP collection and obtain the final RTK+SLAM points (**optimized north-east-elevation coordinates)**.



2）GCP Point Collection in SLAM Mode

GCP point collection in pole mode is similar to handheld mode, with the difference being that in pole mode, the **pole height** needs to be entered, which will not be repeated here.

7.5. Breakpoint Continuation Scan

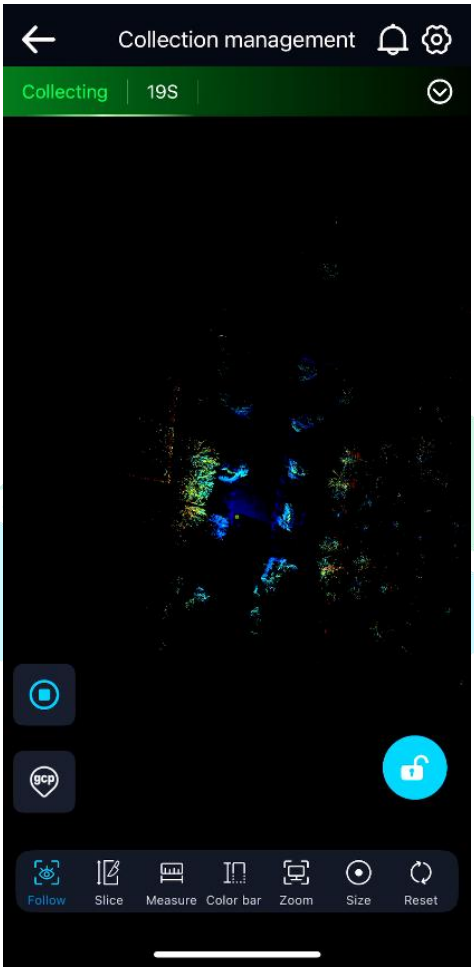
When collecting without GNSS, breakpoint continuation scan can keep the spatial data consistent between different flights. Breakpoint continuation scan can be performed on collection tasks with the real-time point cloud.

Note: The task for breakpoint continuation scan must have real-time point cloud; otherwise, continuation scan matching cannot be performed. After selecting the task for continuation scan, the current collection task will automatically enable real-time point cloud, without user selection.



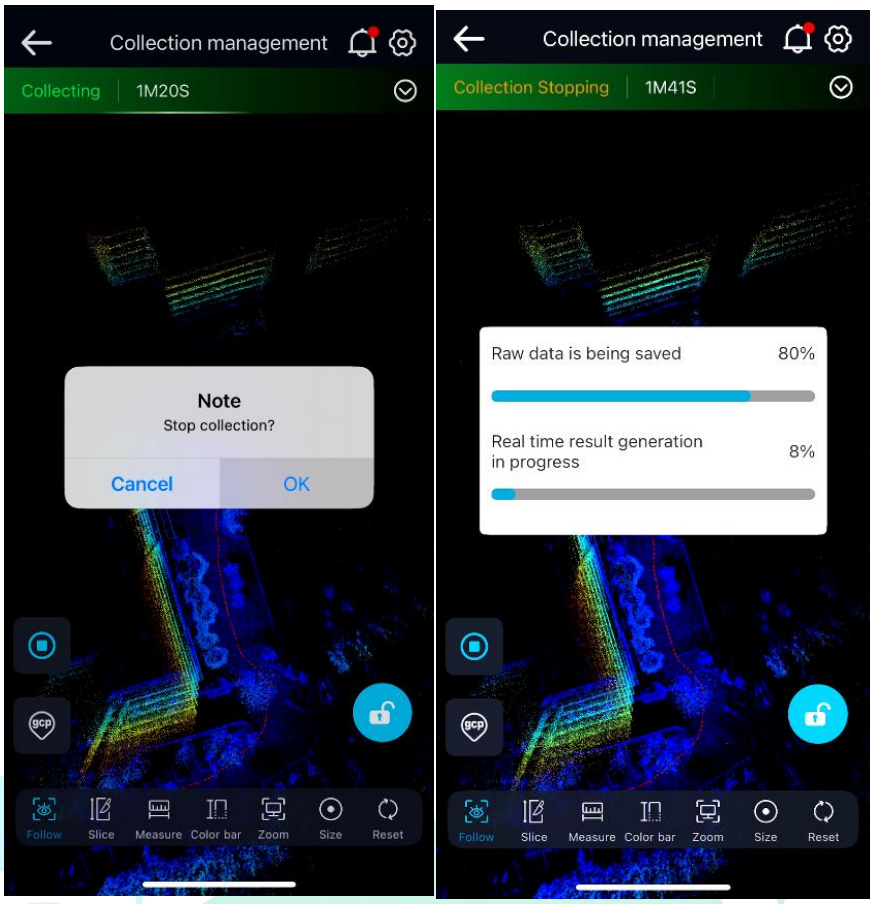


After selecting the project that needs continuation scanning, wait for the APP to prompt "**Continued scan matching successful, continuing scanning**", and when the status bar changes to "**Collecting**", normal collection can proceed.

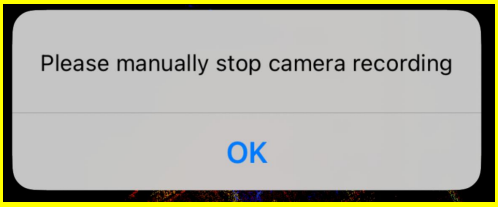


7.6. Stop Collection

After completing a task collection, you can slowly place the LiGrip on a stationary object or keep the handheld LiGrip main unit stable, and click the "Stop Collection" button on the APP control interface. It will prompt "Stop collection?", click "OK", and at this time the APP voice prompt will say "Stopped collection, data is being saved". When the progress bar disappears, the voice will say, "Data saved," and you can continue to collect the next project.



When the handheld camera is an external camera, some models will automatically stop recording, while others will not. If the APP prompts "Please manually stop camera recording," please manually press the camera's record button to stop.



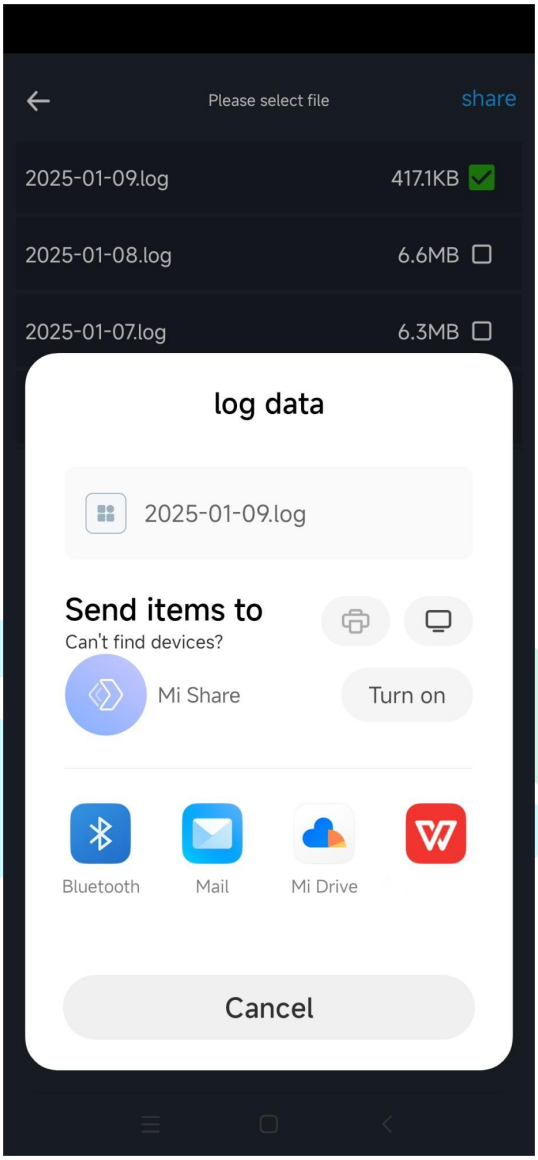
Chapter VIII FAQ

8.1. How to Enable APP Voice Prompts?

The mobile device needs to have the Google TTS voice engine installed. The APP will guide you to install this engine in "My" — "GreenValley Settings." If the installation is consistently unsuccessful, it may be due to the mobile device not supporting it, and it is recommended to switch to another mobile device.

8.2. How to Share APP Logs

In "**Feedback**," select "**Log Data**," choose the log file for the day, then click the "**Share**" button and select the sharing method.



8.3. APP Performance Requirements for Mobile Phones

iOS: Apple phones or tablets with iOS 12 or above, and a processor of A10 or higher

Android: The minimum system requirement is Android 8, with at least 6 GB RAM, and a built-in GPS module

8.4. Download Address

Android: https://www.greenvalleyintl.com/downloadCenter?show=GreenValley+APP+
iOS: Search for GreenValley on the APP Store

